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CURRENT METER DATA REPORT FOR THE EASTERN PART OF THE CARIBBEAN--ETC(U)
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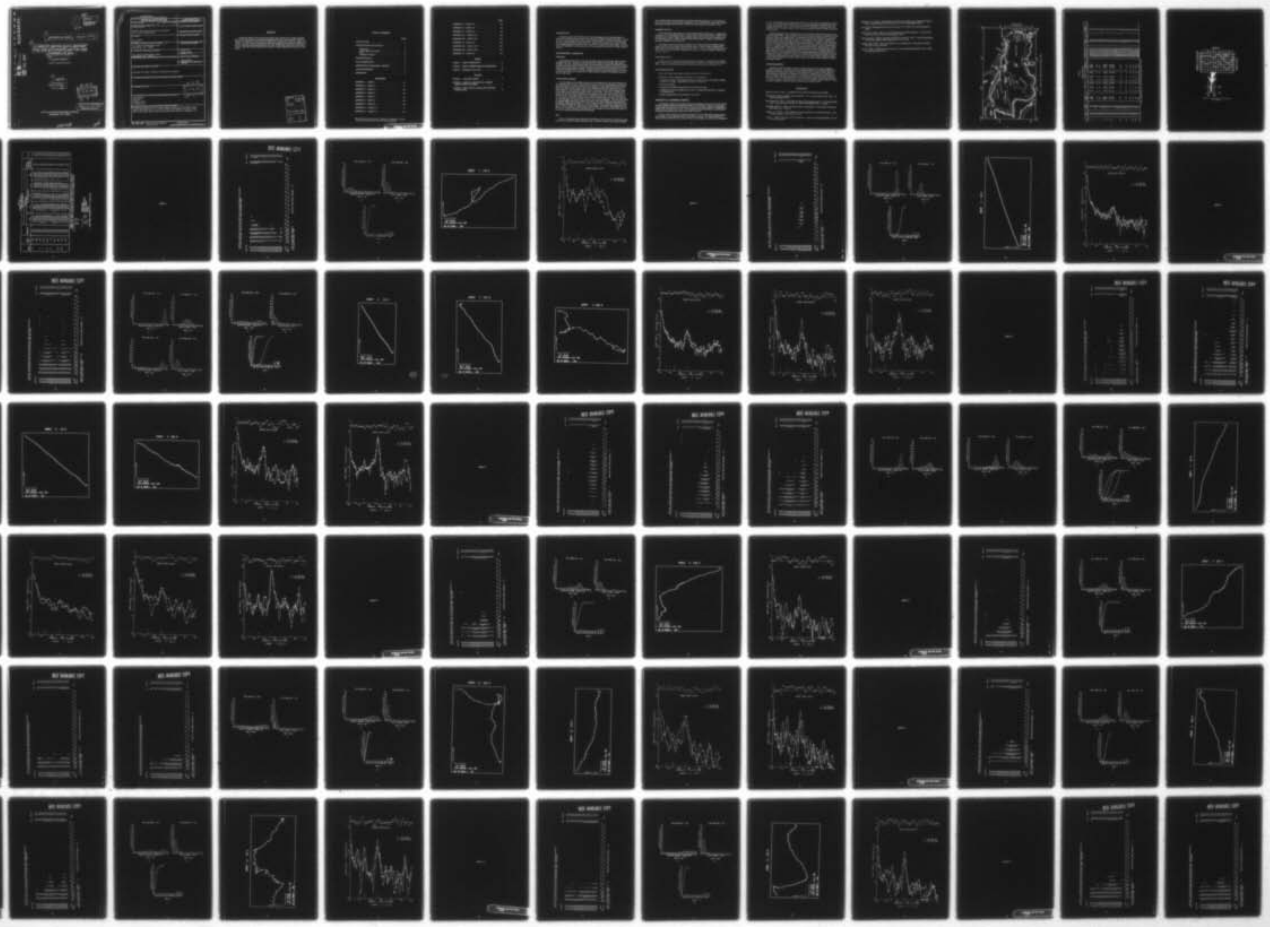

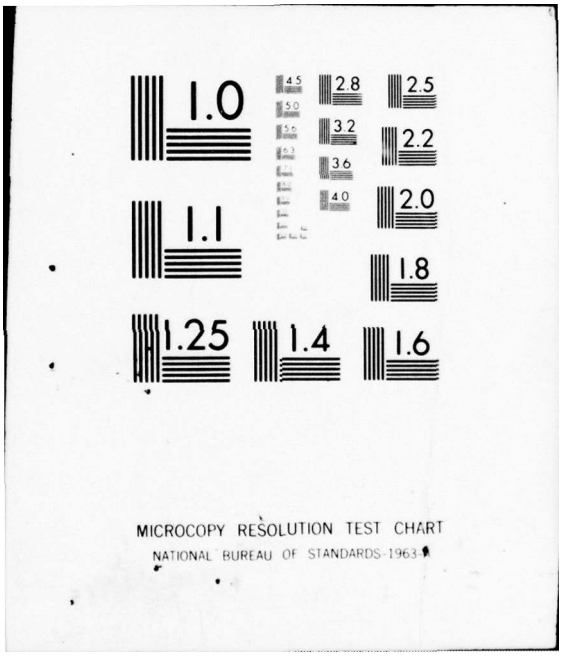
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(10) D. A. BURNS, M. CAR

Physical Oceanography Division

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Preliminary analysis of 36 current meter records from 18 arrays in the eastern Caribbean Sea for all four seasons and depths from 95 to 1910 meters show mean speed varying from less than 1cm/sec to 90cm/sec.

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ABSTRACT

Preliminary analysis of 36 current meter records, from 18 arrays in the eastern Caribbean Sea, showed wide variation in mean speed ranging from less than 1 cm/sec near St. Croix and Vieques, to a maximum of about 90 cm/sec between St. Lucia and St. Vincent at a depth of 45 meters. Ten of the records had significant tidal current signatures with maximum amplitude of the M2 constituent attaining approximately 24 cm/sec at 590 meters between St. Lucia and St. Vincent. Data were recorded during all four seasons at depths ranging from 45 meters to 1910 meters.

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APPENDICES*

*Each appendix contains frequency distribution and histograms of current speed and direction, progressive vector and energy spectra plots.

TABLES

FIGURES

INTRODUCTION

During the period 1967–1972 the U.S. Naval Oceanographic Office (NAVOCEANO) installed and recovered numerous current meter arrays in the eastern Caribbean Sea region. A careful review of all available archival tapes and films indicated that 55 current meter records from 23 arrays could be analyzed as time series data. Smith (1974) reported on 11 of these records from Anegada Passage, and Banchero (1971) reported on 8 records from Beata Ridge. This technical note summarizes the initial processing of the remaining 36 records from 18 arrays (Figure 1, Table 1).

OCEANOGRAPHIC BACKGROUND

Climatology

The Caribbean Sea area lies in the zone of easterly trade winds which are highly persistent throughout the year. Moving in a clockwise direction around the Azores High they produce, throughout the year, a prevailing wind field that varies between northeast and southeast depending upon season and location. Northeasterly winds persist during autumn and winter and easterly winds persist during spring and summer. Maximum prevailing wind speeds usually occur from mid-summer through winter, with speeds averaging between 8–12 knots during most of the year, except during occurrence of tropical storms (May through November) when speeds in excess of 33 knots may occur.

General Surface Circulation

The main feature of the surface circulation in the Caribbean Sea is the warm westward setting Caribbean Current which is formed from the junction of the North Equatorial Current and the Guiana Current. Since the north-east trade winds are the main driving force for the North Equatorial Current and the Guiana Current, the Caribbean Current varies seasonally with the trades (Figure 2). The Caribbean Current attains its maximum surface velocity during summer (June–August) and its minimum during October and November. The current eventually flows through the Yucatan Straits contributing to the circulation within the Gulf of Mexico and the Florida Current. The maximum flow of the Caribbean Current (38 to 43 cm/sec with peak of 135 cm/sec) is located 200 to 300 km north of the Venezuelan Coast with most of it entering the Caribbean Sea in the straits north and south of St. Lucia (Fairbridge). The main flow crosses the Jamaica Ridge south west of Jamaica, sets west in the Cayman Basin and then north again through the Yucatan Strait (Figure 1). Thus, the main axis of the Caribbean Current sets across the Caribbean Sea from east south east to west northwest. Mean annual prevailing surface circulation is shown in Figure 3. Stalculp (1971), Wust (1964), and Gordon (1967) indicate that the main source of water entering the Caribbean Sea flows through the Lesser Antilles with most of the volume transport going through Grenada Passage.

Tides

Tides in the Caribbean Sea are generally characterized as mixed, except in a small area south of Puerto Rico where the tides are strongly diurnal. Along the northern and eastern boundaries

of the Caribbean Sea, the mixed tides have a strong semi-diurnal component. An exception to this is in the vicinity of Fort of France, Martinique where a strong diurnal component is present. Tide ranges throughout the Caribbean are small with spring ranges not exceeding 1 meter.

Topographic Features

The Caribbean Sea region falls into two natural bathymetric sub divisions: A western basin, consisting of the Yucatan Basin (depth > 5000 m) and the Cayman Basin (depth > 6000 m), lying between the Yucatan Channel and the Jamaica Ridge, and an eastern basin consisting of the Columbia Basin (depth > 4000 m) and the Venezuela Basin (depth > 5000 m), lying between the Jamaica Ridge and the Antillean Arc.

The western basin connects with the Atlantic to the north through the Windward passage (depth > 3000 m) and the eastern basin connects with the Atlantic through Anegada (depth 1500–2000 m) and Mona passage (depth less than 1000 m). The Yucatan Strait (depth just over 2000 m) is the major outlet for the Caribbean Sea region. The major topographic features are shown in Figure 1.

INSTRUMENTATION

Geodyne type A-101 current meters were used on each array. The operation and physical characteristics of these instruments has been described extensively in the literature (e.g., Guthrie, 1974). Implant and recovery procedures were essentially as described by Guthrie (ref. cit).

DATA PRESENTATION

Each current meter record within an array is presented in the form of:

- Bivariate frequency distribution of current speed and direction.
- Histogram of speed. The hatched area on the histogram indicates the percent of speeds which were 0 cm/sec. Class interval is either 5 or 10 cm/sec.
- Direction histogram.
- Composite of cumulative speed plots for all meters of an array.
- Progressive vector plot averaged every 12 hours to indicate the mean drift. S indicates the starting point.
- Rotary energy spectra of the horizontal current field.

DESCRIPTION OF MEASURED CURRENTS

Considerable variation in mean speed was found throughout the area and ten of the records indicated significant diurnal and semidiurnal tidal current oscillations. Table 2 contains mean current speeds and directions for each record. Greatest mean current speeds were measured at a depth of 45 m at arrays 4, 5, 6, and 7. At this depth the current prevailed in a northwesterly set attaining maximum speed of about 89.8 cm/sec at array 5.

Table 3 contains the results of harmonic analysis of records which had at least 30 percent of the variance of one component due to tidal frequency motion. The column labeled F in Table 3 further classifies the type of tidal current as either semidiurnal, diurnal or a combination

of both. The northern sector of the region (arrays 14, 15, 15A, 15B) in Mona Passage, and near St. Croix and Vieques Island, responds mainly to the mixed semidiurnal oscillations, while the southern sector (arrays 5, 6, 7) near St. Vincent and St. Lucia appears to respond more to the semidiurnal type of oscillation with the E-W component generally being the strongest component in both sectors.

Rotary energy spectra were computed for each record using techniques which have been described by Earle (1975). These techniques resolve vector current records into clockwise (cw) and counterclockwise (ccw) energy spectra. A comparison of these two components at a particular frequency may provide insight into the direction of movement of the current. Compare the spectra at array 1, 130 m and array 6, 590 m. The symbols I, D, S along the bottom axis indicate the inertial, diurnal and semidiurnal frequencies respectively. At array 1 at the S frequency most of the energy is clockwise, while at array 6, at the same frequency, there is almost equal division of energy between clockwise and counterclockwise direction. Tidal frequency currents rotate clockwise at array 1, 130 m and are rectilinear at array 6, 590 m (since cw and ccw are nearly equal). This is to be expected since array 1, 130 m, is not in a constricted region but array 6, 590 m is. The small graph above the spectrum labeled Rotary Coefficients provides an estimate on the type of rotation. A value of +1 indicates clockwise circular rotation, a value of -1 indicates counterclockwise circular rotation, and a value near 0 indicates rectilinear motion. Since no band averaging was used for spectra computations there are only 2 degrees of freedom per energy estimate.

ACKNOWLEDGMENTS

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REFERENCES

Banchero, Louis A. (1971). Unpublished Current Meter Data Report for Beta Ridge.

Climatological and Oceanographic Atlas for Mariners. Vol. 1, North Atlantic Ocean, 1959. U.S. Naval Oceanographic Office.

Earle, Marshall D. (1975). Intermediate and Deep Current Measurements in the Northeast Pacific Ocean. Technical Report No. 232, U.S. Naval Oceanographic Office. (in press)

Fairbridge, Rhodes W. (1966). The Encyclopedia of Oceanography. Encyclopedia of Earth Sciences Series, Vol. 1, 1021 pp.

Fuglister, F. C. (1951). Annual Variations in Current Speeds in the Gulf Stream System. Journal Marine Research, Vol. 10, pp. 119–127.

Gordon, L. (1967). Circulation in the Caribbean Sea. Journal of Geophysical Research, Vol. 72, No. 24, pp. 6207–62.

Guthrie, R., et al. (1974). Current Meter Data Report for a Region of the Northeastern Pacific Ocean. Technical Note 6110-03-74, 94 pp., U.S. Naval Oceanographic Office.

H. O. Pub. 21, Sailing Directions for the West Indies, Vol. 2, 1958, U.S. Naval Oceanographic Office.

Smith, Otis R. (1974). Results of Current Observations Caribbean Operations. Technical Note 6110-1-74, 22 pp., U.S. Naval Oceanographic Office.

Stalcup, Marvel C., William G. Metcalf and Marquerite Zemanovic (1971). Current Measurements in the Lesser Antilles. WHOI Reference No. 71–51, 14 pp.

Sturges, Wilton (1965). Water Characteristics of the Caribbean Sea. Journal Marine Research, Vol. 23, No. 2, pp. 147–162.

Wust, G. (1964). Stratification and Circulation in the Antillean-Caribbean Basin, Part 1, Columbia University Press, 201 pp.

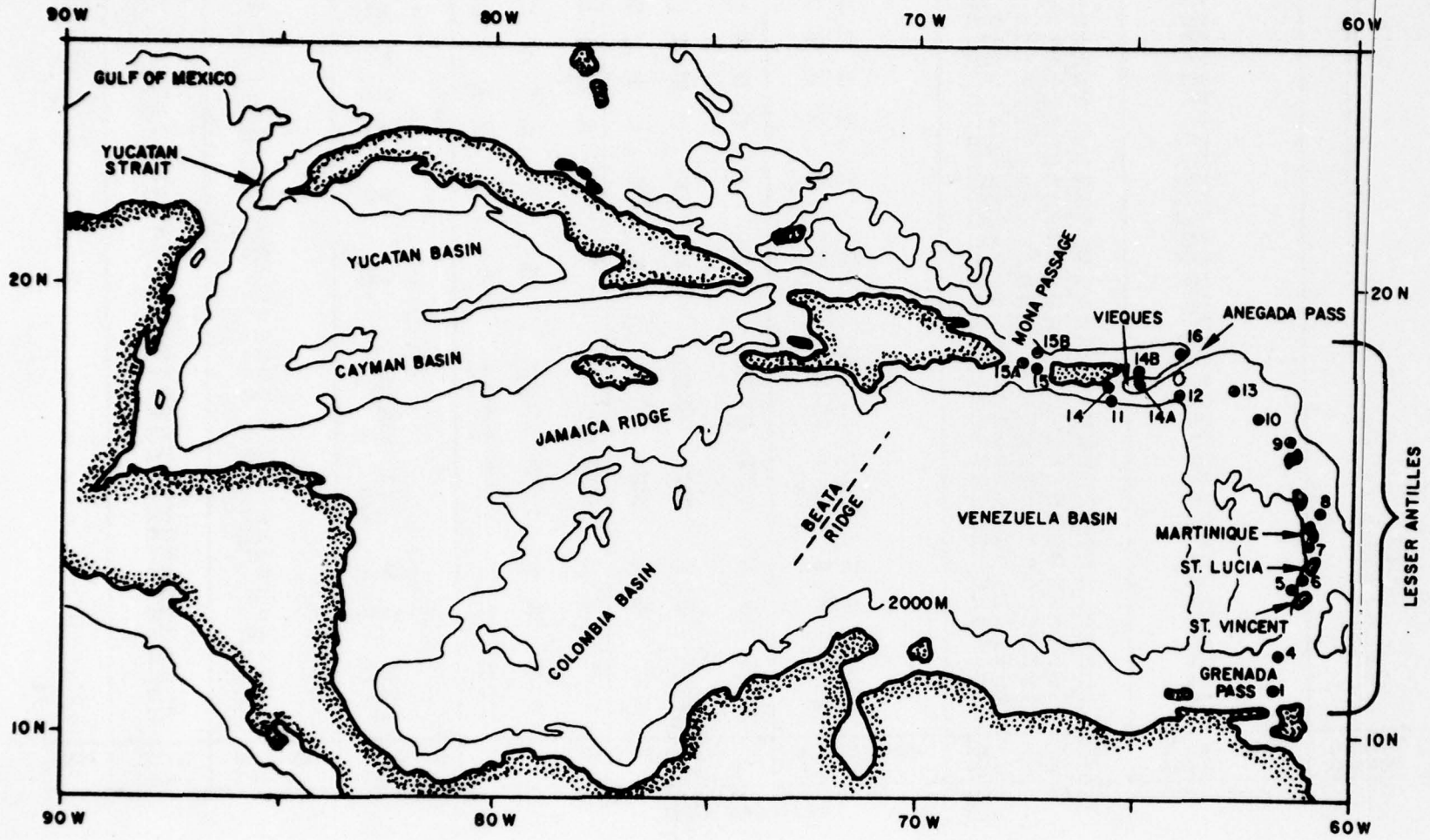

Figure 1 — Location Chart (2000 m isobath from Sturges, 1965)

Table 1

ARRAY DESCRIPTION

ARRAY	FILM SERIAL	SAMPLE DEPTH (M)	WATER DEPTH (M)	LAT. N 0	LAT. N '	LAT. N "	LONG. W 0	LONG. W '	LONG. W "	INERTIAL PERIOD (HOURS)	START TIME (Z) HOUR,DAY,MO,YR	USABLE RECORD (HOURS)	SAMPLING INTERVAL (MINS)
1	835	130	140	11	08	18	61	35	00	62.12	1100,06,08,72	366	10
4	828	45	640	11	51	42	61	45	42	58.38	1900,08,05,72	568	10
5	794	45	1600	13	29	24	61	08	00	51.44	0000,13,06,72	529	10
	796	245									0000,13,06,72	529	10
	818	1590									0000,13,06,72	529	10
6	803	45	600	13	37	48	61	08	00	50.92	2000,12,07,72	545	10
	795	590									2000,12,07,72	546	10
7	805	45	1030	14	19	18	60	59	42	48.51	1200,12,07,72	338	10
	804	245									1200,12,07,72	348	10
	800	1010									1200,12,07,72	538	20
8	797	290	2060	15	02	00	60	54	42	46.26	1300,11,07,72	546	10
9	764	460	1045	16	36	00	61	15	48	42.00	0000,16,06,72	522	10
10	762	260	760	16	53	54	62	02	48	41.28	0600,16,06,72	436	10
	755	745									0600,16,06,72	518	10
11	570	220	1975	17	50	53	65	47	37	39.15	1500,28,03,72	453	10
12	855	25	30	17	39	14	64	55	11	39.57	1400,25,10,72	890	15
13	760	245	735	17	44	54	63	03	48	39.37	1700,16,06,72	523	10
14	566	100	1915	17	52	53	65	54	38	39.08	1800,30,03,67	360	10
	569	105									1800,30,03,67	354	10
	571	810									1800,30,03,67	356	10
	567	1905									1800,30,03,67	354	5
	568	1910									1800,30,03,67	297	10
14A	544	240	1430	17	58	24	65	37	46	38.89	1900,16,12,68	1249	20
	545	605									1900,16,12,68	286	20
	546	1335									1900,16,12,68	1245	20
	543	1420									1900,16,12,68	1242	20
14B	547	250	980	18	02	24	65	35	54	38.75	1600,16,12,68	1260	20
	548	955									1600,16,12,68	642	20
	549	970									1600,16,12,68	1249	20
15	896	285	485	18	11	00	67	41	07	38.45	1300,29,09,72	682	10
	897	475									1300,29,09,72	58	10
15A	898	85	575	18	19	00	68	00	00	38.18	2200,29,12,72	670	10
	900	560									2200,29,12,72	666	10
15B	901	350	625	18	31	06	67	48	02	37.78	1700,28,09,72	666	10
	902	615									1700,28,09,72	665	10
16	756	280	2075	18	31	48	64	02	00	37.76	2200,14,06,72	514	10

NOTE: Mooring Type-Taut Line with Subsurface Buoy(s)-All Arrays

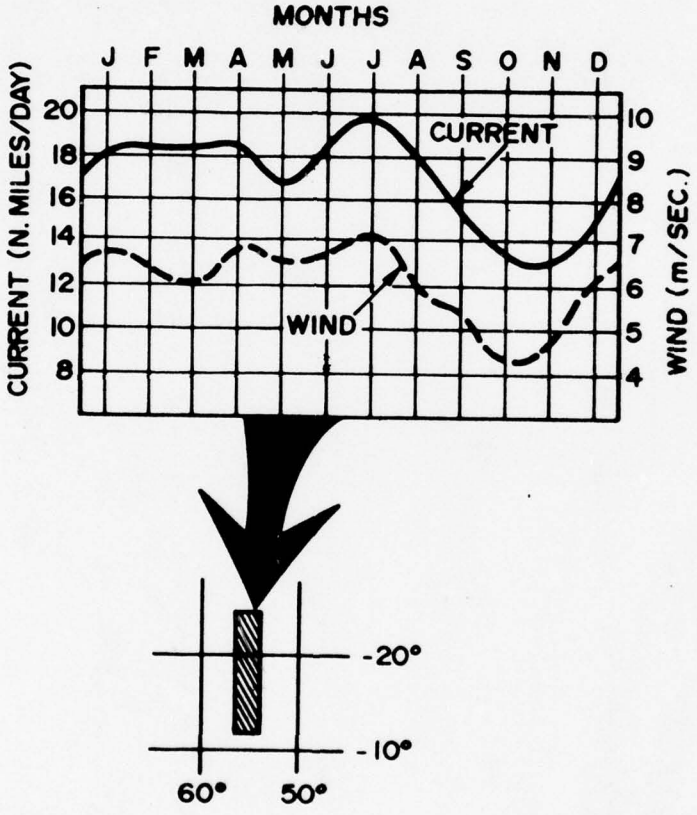

Figure 2 — Annual variation of current speed
(after Fuglister)

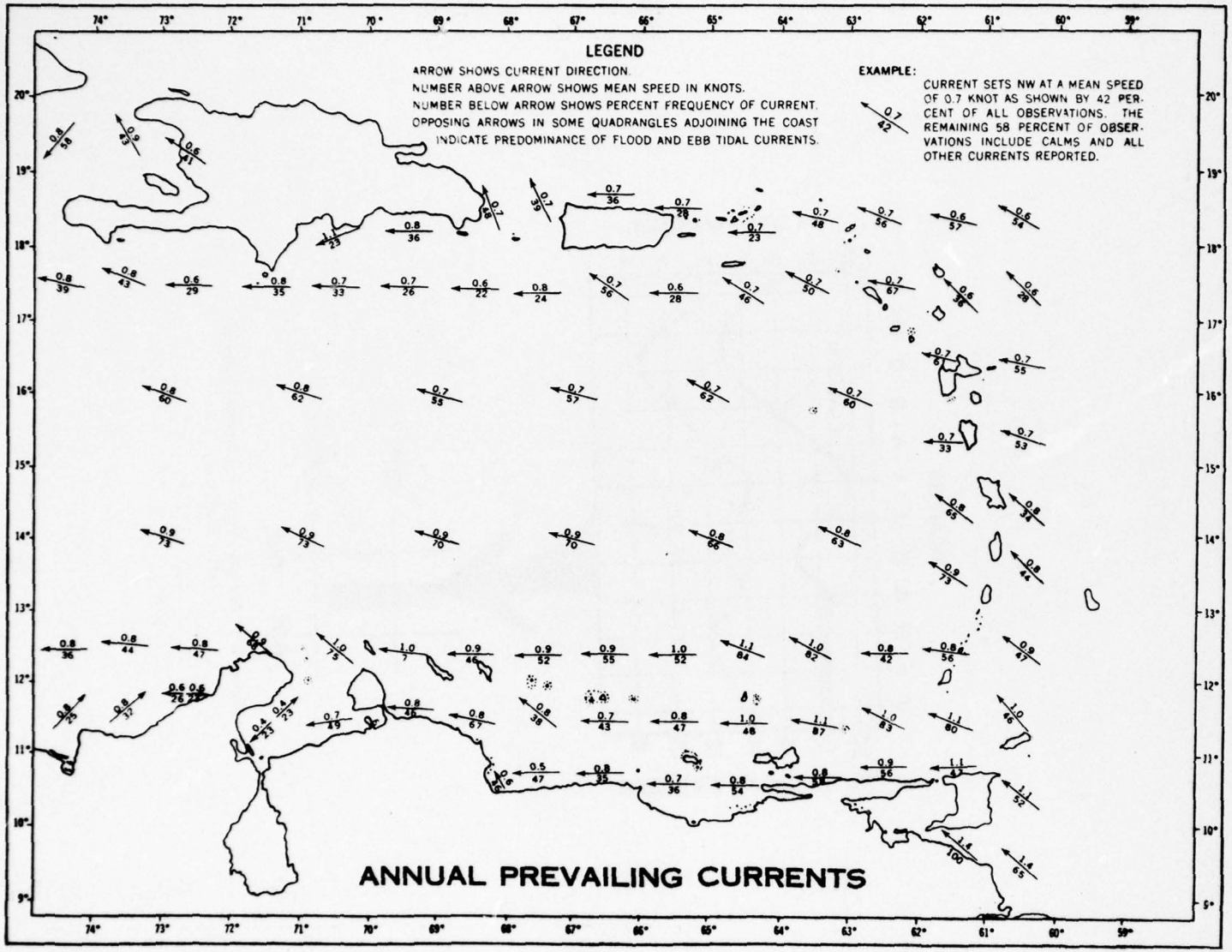

Figure 3 — Mean annual prevailing surface circulation

Table 2

MEAN CURRENT SPEED AND DIRECTION

ARRAY	DEPTH (M)	CM/SEC			DIRECTION (°T)
		E-W	N-S	SPEED	
1	130	5.3	3.0	6.1	061
4	45	-63.8	-23.2	67.9	250
5	45	-49.5	75.0	89.8	326
	245	-7.2	11.6	13.6	328
	1590	-1.1	0.7	1.3	302
6	45	-47.8	38.0	61.0	308
	590	-7.6	4.3	8.8	299
7	45	-46.8	15.9	49.4	289
	245	-28.1	4.6	28.5	279
	1010	-5.9	-2.7	6.6	245
8	290	-6.3	-5.1	8.0	231
9	480	-4.1	-3.5	5.4	230
10	260	-1.1	1.8	2.1	329
	745	-4.4	1.1	4.5	284
11	220	-14.9	-4.9	15.7	252
12	25	-1.8	0.1	1.8	274
13	245	-3.8	0.9	3.9	284
14	190	-4.2	-1.5	4.4	250
	195	-4.9	-0.4	4.9	265
	810	-4.2	-0.7	4.2	260
	1905	-0.2	0.4	0.4	339
	1910	0.0	0.7	0.7	001
14A	240	-7.6	2.6	8.0	289
	605	4.7	2.6	5.4	061
	1335	-0.1	0.5	0.5	349
	1420	3.4	2.6	4.3	053
14B	250	-4.8	0.6	4.8	277
	955	-0.2	-0.1	0.2	243
	970	0.6	-0.1	0.6	260
15	285	3.8	1.7	4.2	066
	475	1.1	-0.8	1.4	126
15A	85	0.7	-2.6	1.4	165
	560	-2.6	1.2	2.9	295
15B	350	-0.5	2.9	2.9	350
	615	3.0	1.7	3.4	060
16	280	-8.1	-6.9	10.6	230

Table 3

HARMONIC ANALYSIS

ARRAY	DEPTH (M)	COMPONENT	AMPLITUDE/PHASE [1] CONSTITUENT CM SEC/DEGREES [1] M_2	S_2	K_1	O_1	M_{s4}	PERCENT RESIDUAL VARIANCE**	F***
5	245	E-W	8.63/103	2.24/112	.22/174	.71/22	.52/153	54	.16
		N-S	3.40/11	.98/5	.38/110	.58/180	1.39/97	79	.10
	1590	E-W	9.91/305	6.46/320	.78/129	.83/205	1.00/149	41	.08
		N-S	4.73/172	2.91/82	.51/255	.29/349	1.16/223	65	.22
6	590	E-W	17.67/128	6.01/21	1.07/272	.51/242	3.56/178	36	.16
		N-S	24.26/315	8.67/203	1.17/34	.67/50	3.62/39	20	.18
7	1010	E-W	20.55/103	5.82/146	2.78/282	1.36/336	2.10/196	35	.07
		N-S	4.97/304	3.10/307	1.15/97	.34/345	2.60/40	70	.06
14	1905	E-W	2.73/284	.72/167	.74/53	1.19/247	.21/186	53	.56
		N-S	.51/127	.34/181	.89/77	.18/146	.40/262	90	1.26
15	85	E-W	2.88/230	1.63/160	3.64/57	2.09/229	1.85/159	94	.54
		N-S	20.12/36	3.64/260	2.04/354	2.75/301	7.12/323	53	1.87
	*475	E-W	22.89/10	10.47/19	2.55/7	8.68/160	.96/98	13	1.27
		N-S	17.87/352	5.58/336	8.04/171	5.61/320	2.23/106	18	.20
15A	560	E-W	12.43/346	2.56/217	4.88/55	3.25/233	1.10/198	58	.65
		N-S	2.42/62	.91/273	1.32/54	2.63/158	.59/32	96	1.66
15B	350	E-W	4.56/129	1.88/249	1.85/59	2.08/93	.20/164	70	.61
		N-S	4.44/155	2.72/160	2.68/320	1.92/38	.81/349	70	.64
	615	E-W	13.52/300	1.70/244	6.12/322	3.82/16	.31/185	32	.33
		N-S	4.45/275	.86/21	5.50/331	3.33/3	1.56/113	52	.58

* SHORT TIME SERIES (58 hours) CONSTITUENTS NOT FULLY SEPERATED

** PERCENT OF TOTAL VARIANCE NOT DUE TO TIDAL FREQUENCY MOTION.

*** $F = \frac{K_1 + O_1}{M_2 + S_2}$

F = 0 -.25 SEMIDIURNAL
.25 - 1.50 MIXED SEMIDIURNAL
1.50 - 3.00 MIXED DIURNAL
> 3.0 DIURNAL

1 - PHASE ANGLE REFERENCED TO +4 TIME ZONE

ARRAY 1

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140M SAMPLE DEPTH=130M SAMPLE RATE 10MIN RECORD LENGTH=366 HOURS

DIRECTION																						SUM	PER.CT.
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15- 30	18	67	30	23	17	8	3															166	7.6
30- 45	24	78	113	69	10	1																295	13.4
45- 60	25	80	96	48	24	1																274	12.5
60- 75	13	75	120	57	18																	283	12.9
75- 90	17	59	96	57	20																	209	9.5
90-105	17	49	29	26	1																	122	5.6
105-120	19	29	25	3																		76	3.5
120-135	17	24	15	14																		70	3.2
135-150	15	18	5	10																		48	2.2
150-165	12	19	18	9																		58	2.6
165-180	7	16	15	14																		52	2.4
180-195	7	14	19	2																		42	1.9
195-210	3	15	18	2																		38	1.7
210-225	5	28	24	7																		64	2.9
225-240	3	20	17	11																		51	2.3
240-255	2	6	6	12	3																	29	1.3
255-270	5	13	13	4																		35	1.6
270-285	2	11	18	1																		32	1.5
285-300	1	2	1																			4	0.2
300-315	1	5																				6	0.3
315-330	3	6																				9	0.4
330-345	14	10	9	4																		37	1.7
345-360	3	45	23	14																		85	3.9

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	248	741	696	403	93	10	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2194
PER.CT.	11.3	33.7	31.7	18.3	4.2	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

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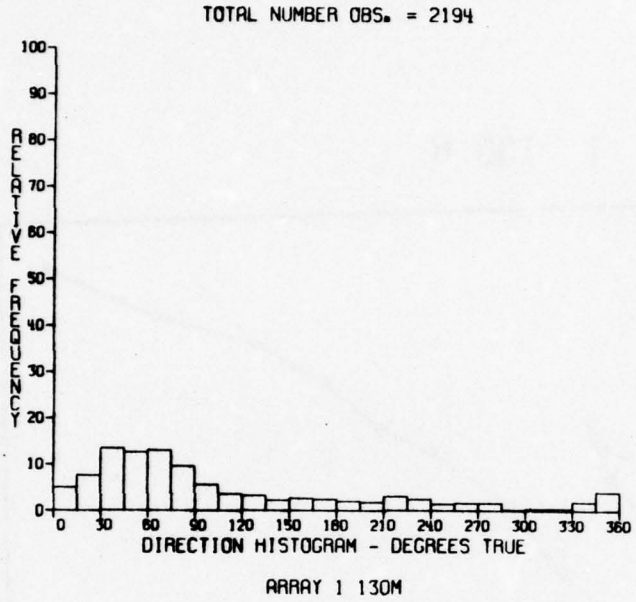
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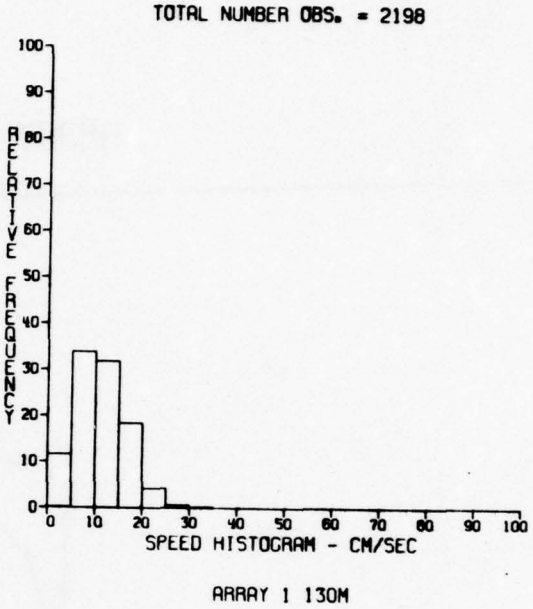
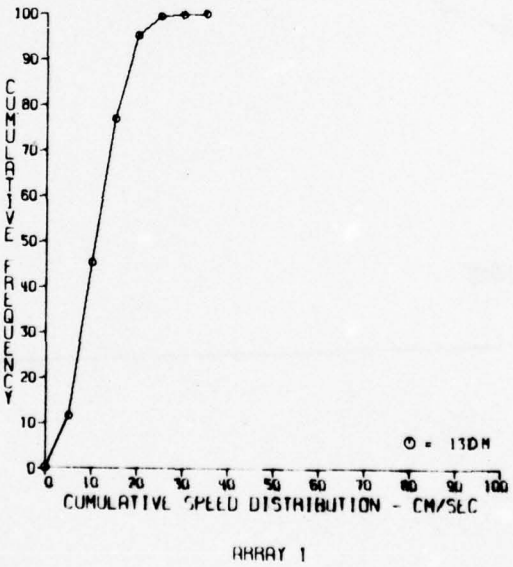
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 1 130M

(a)

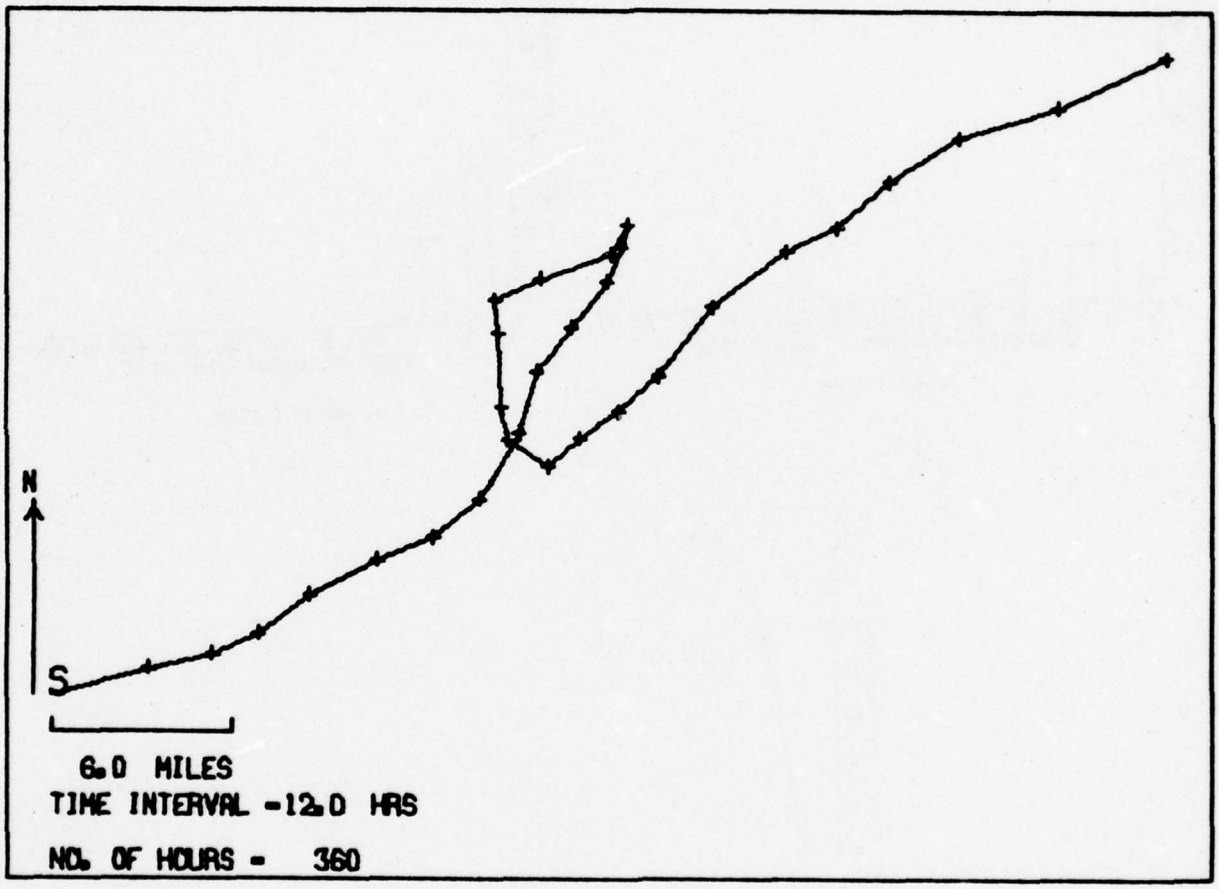

TOTAL NUMBER OBS. = 2198
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 1 130M

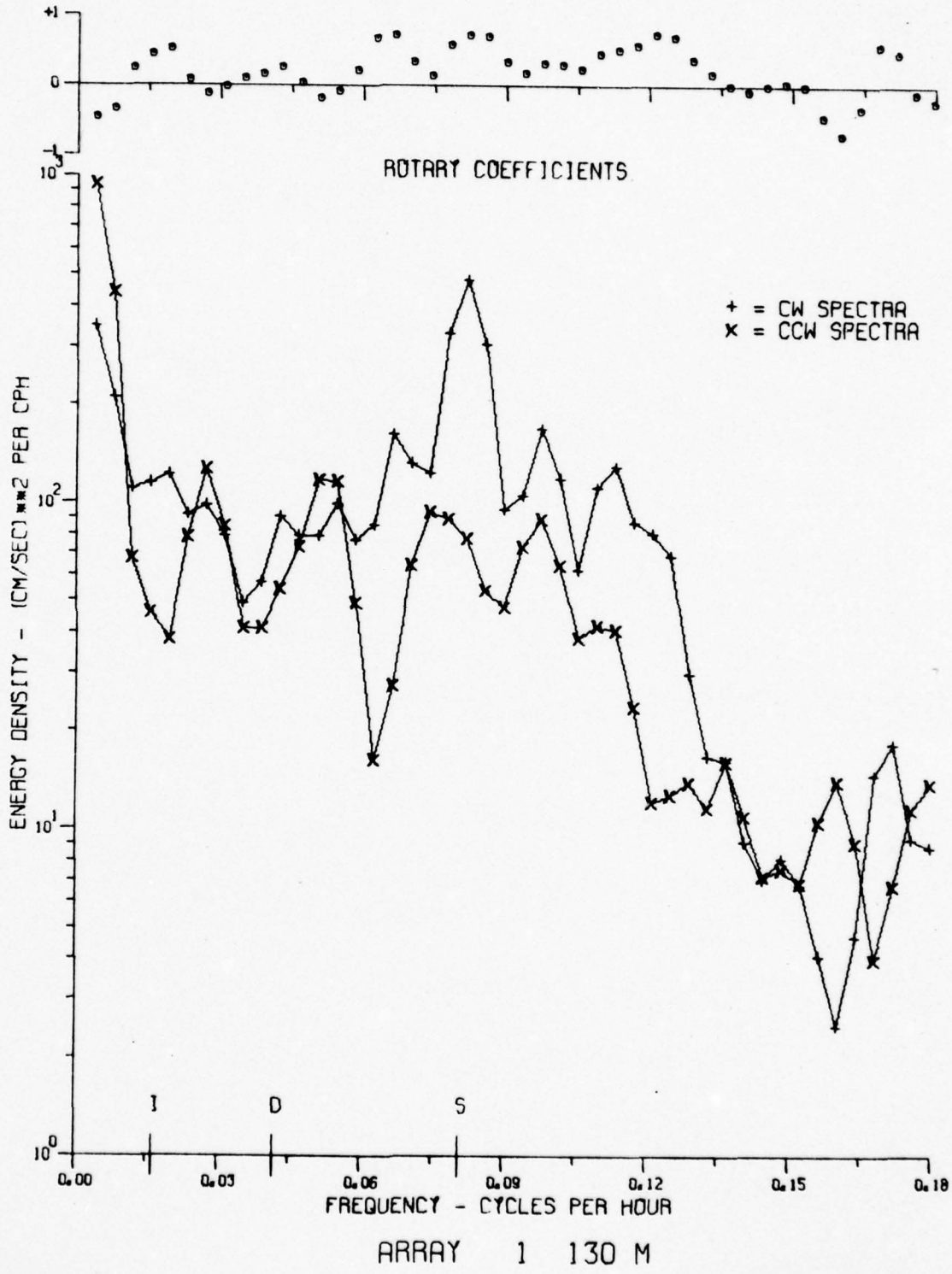
(b)


CUMULATIVE FREQUENCY
⊙ = 130M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 1

(c)

ARRAY 1 130 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
× = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 1 130 M

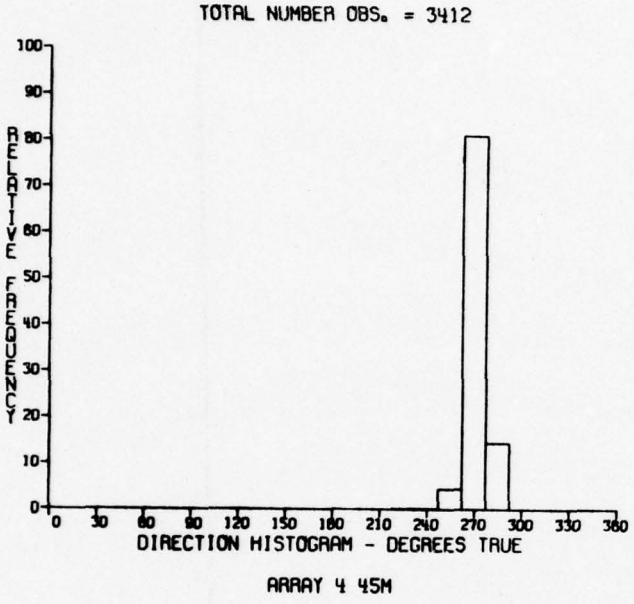
ARRAY 4

CARIB EPS 11 51 42N 61 45 42W FILM 828 START TIME 19002 08/05/72 WATER DEPTH=
640M SAMPLE DEPTH=05M SAMPLE RATE 10 MIN RECORD LENGTH=068 HOURS

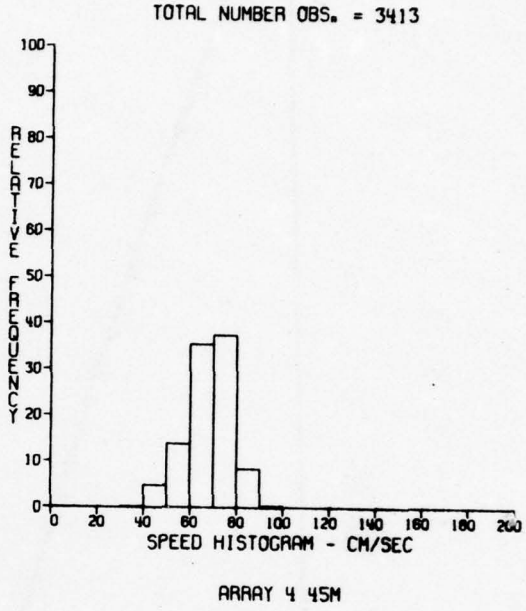
DIRECTION																					SUM	PER.CT.
0- 15																					0	0.0
15- 30																					0	0.0
30- 45																					0	0.0
45- 60																					0	0.0
60- 75																					0	0.0
75- 90																					0	0.0
90-105																					0	0.0
105-120																					0	0.0
120-135																					0	0.0
135-150																					0	0.0
150-165																					0	0.0
165-180																					0	0.0
180-195																					0	0.0
195-210							2														2	0.1
210-225								3	4												7	0.2
225-240							4	11	34	51	41	9									150	4.4
240-255								145	373	985	1027	228	6								2764	81.0
255-270								5	55	171	210	45	3								489	14.3
270-285																					0	0.0
285-300																					0	0.0
300-315																					0	0.0
315-330																					0	0.0
330-345																					0	0.0
345-360																					0	0.0

SPEED	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	
SUM	0	0	0	0	6	164	466	1207	1278	282	9	0	0	0	0	0	0	0	0	0	0	3412
PER.CT.	0.0	0.0	0.0	0.0	0.2	4.8	13.7	35.4	37.4	8.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

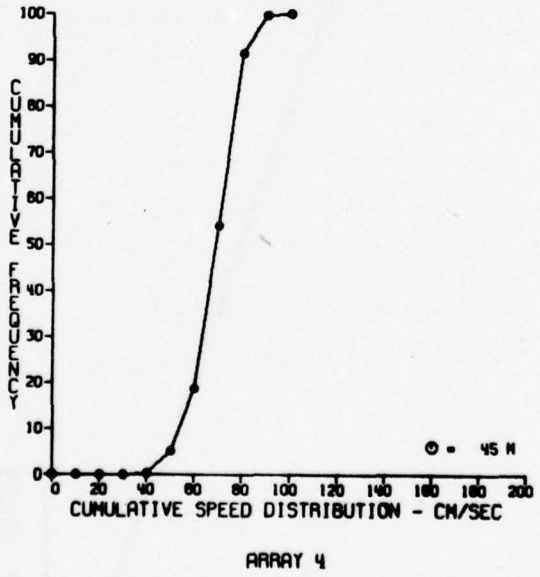
NUMBER OF ZERO SPEED AVERAGES = 1 PERCENTAGE ZERO SPEED AVERAGES = 0.0
TOTAL NUMBER OF OBS. = 3413


TOTAL NUMBER OBS. = 3412
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 4 45M

(a)

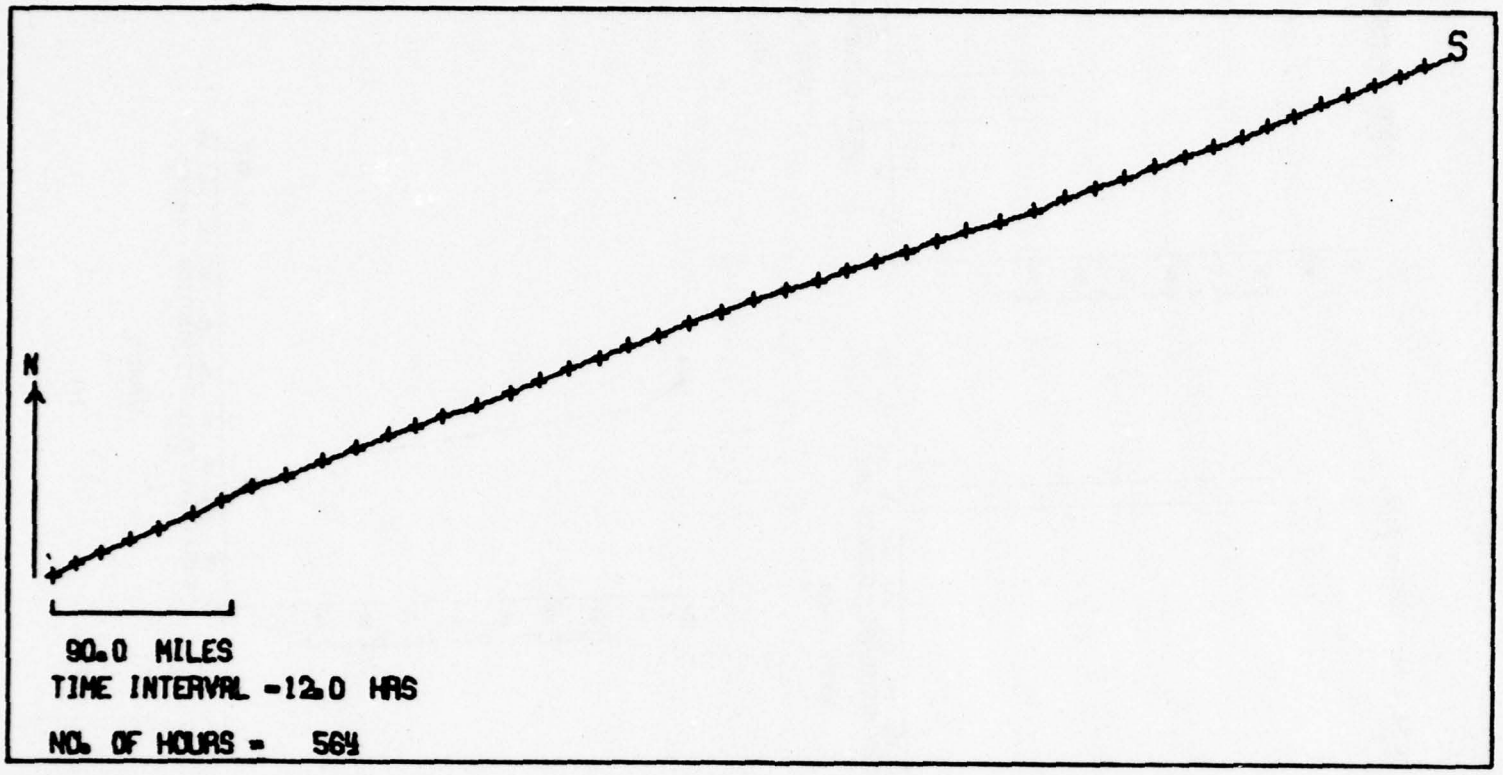

TOTAL NUMBER OBS. = 3413
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 4 45M

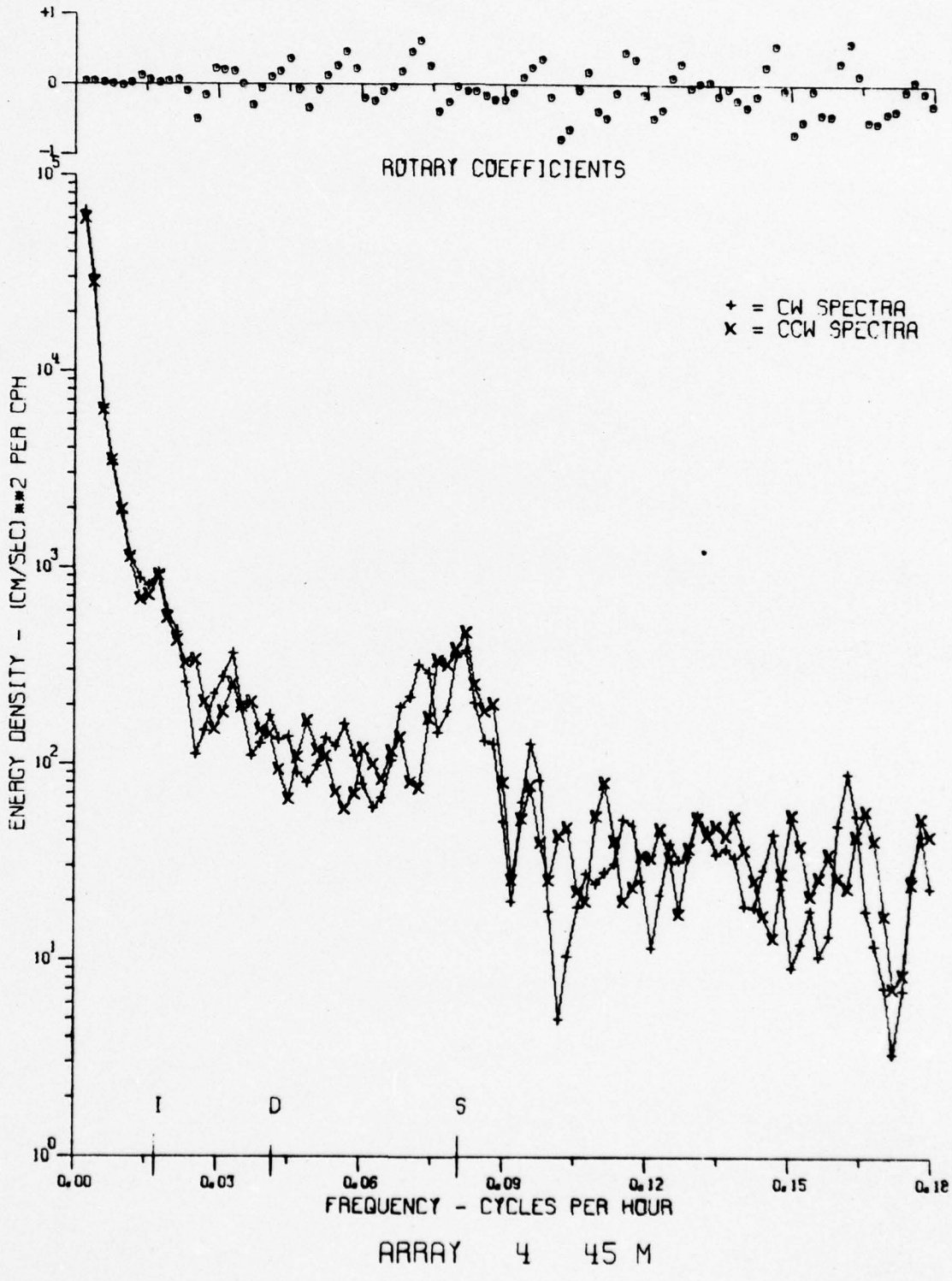
(b)


CUMULATIVE FREQUENCY
⊙ = 45 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 4

(c)

ARRAY 4 45 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^4
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR

ARRAY 4 45 M

ARRAY 5

CARIB EPS 13 29 24N 61 08 COR FILM 794 START TIME 00004 06/13/72 WATER DEPTH=
1600M SAMPLE DEPTH=45M SAMPLE RATE 10MIN RECORD LENGTH=529 HOURS

DIRECTION													SUM	PER.CT.
0- 15					10	1							11	0.3
15- 30													0	0.0
30- 45													0	0.0
45- 60													0	0.0
60- 75													0	0.0
75- 90													0	0.0
90-105													0	0.0
105-120													0	0.0
120-135													0	0.0
135-150													0	0.0
150-165													0	0.0
165-180													0	0.0
180-195													0	0.0
195-210													0	0.0
210-225													0	0.0
225-240													0	0.0
240-255													0	0.0
255-270													0	0.0
270-285							1	2	1				4	0.1
285-300			1	2	17	6	6	8	2				42	1.3
300-315			17	41	61	87	86	60	26	5	1	1	385	12.1
315-330			10	69	145	257	338	372	281	148	52	14	3	1689	53.1
330-345			11	18	47	134	160	119	140	224	83	34	3	973	30.6
345-360		1			1	1	5	7	7	14	21	14	3	74	2.3

SPEED	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	
SUM	0	0	0	1	39	131	281	490	598	568	464	398	149	52	7	0	0	0	0	0		3178
PER.CT.	0.0	0.0	0.0	0.0	1.2	4.1	8.8	15.4	18.8	17.9	14.6	12.5	4.7	1.6	0.2	0.0	0.0	0.0	0.0	0.0		

NUMBER OF ZERO SPEED AVERAGES = 0 PERCENTAGE ZERO SPEED AVERAGES = 0.0
TOTAL NUMBER OF OBS. = 3178

CARIB 8RS 13 29 24N 61 08 00WFILM 796 START TIME 0000Z 06/13/72 WATER DEPTH=
1600M SAMPLE DEPTH=245M SAMPLE RATE 10MIN RECORD LENGTH=529 HOURS

DIRECTION														SUM	PER.CT.
0- 15	5	35	80	73	35	14				3	7	1		253	8.0
15- 30	6	42	55	36	34	8	1							182	5.7
30- 45	12	23	25	6	10	6								82	2.6
45- 60	7	6	16	3	1									33	1.8
60- 75	9	9	6	7	6	2	1							40	1.3
75- 90	3	10	21	25	5									64	2.0
90-105	1	2	9	5	1									18	0.6
105-120	1	3	6	2										12	0.4
120-135		2	5											7	0.2
135-150	2	7												9	0.3
150-165	2													2	0.1
165-180	1	1												2	0.1
180-195	1	3												4	0.1
195-210	1													1	0.0
210-225	3													3	0.1
225-240	1	2												3	0.1
240-255	6	2		2										10	0.3
255-270	9	8	2	4										23	0.7
270-285	6	13	17	5	19	16	2							78	2.5
285-300	5	24	47	70	124	51	8	2						331	10.4
300-315	12	40	140	238	248	54	2	1	1					736	23.2
315-330	12	51	108	228	104	22	2		1					528	16.6
330-345	7	48	102	171	89	17	2							436	13.7
345-360	13	43	87	126	48	3	1							321	10.1

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	125	374	726	1001	724	193	19	3	2	0	0	0	3	7	1	0	0	0	0	0		3178
PER.CT.	3.9	11.8	22.8	31.5	22.8	6.1	0.6	0.1	0.1	0.0	0.0	0.0	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0		

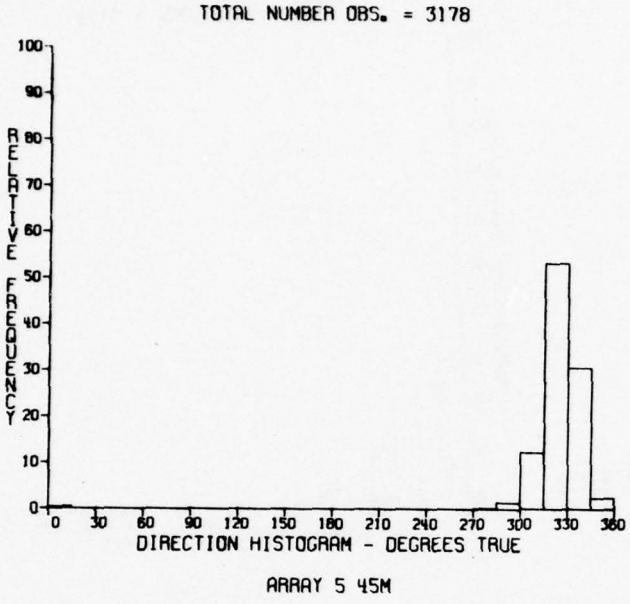
NUMBER OF ZERO SPEED AVERAGES = 0 PERCENTAGE ZERO SPEED AVERAGES = 0.0
TOTAL NUMBER OF OBS. = 3178

CARIB BPS 13 29 24N 61 08 00W FILM 818 START TIME 0000Z 06/13/72 WATER DEPTH=
1600M SAMPLE DEPTH=150M SAMPLE RATE 10MIN RECORD LENGTH=529 HOURS

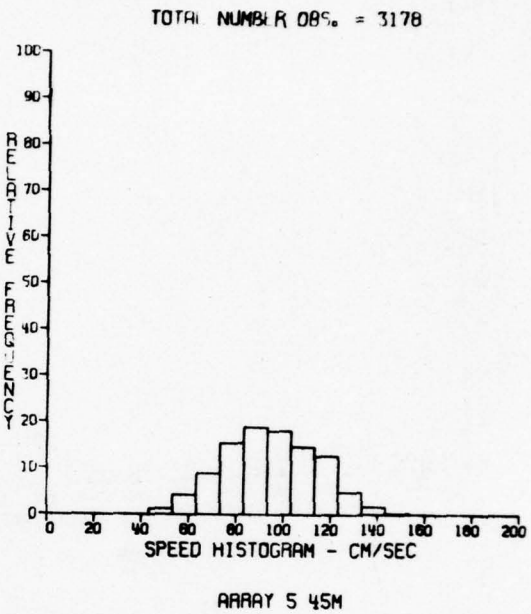
DIRECTION																		SUM	PER.CT.
0- 15	29	19	19	4	4	1							3	7	1			87	2.7
15- 30	15	16	6	2														39	1.2
30- 45	24	22	10	1	1													58	1.8
45- 60	17	27	26	16	8	3	1											98	3.1
60- 75	29	27	26	37	9	3		2	1	1								135	4.2
75- 90	21	29	33	33	16	12	5	5	2									156	4.9
90-105	39	37	23	22	11	12	1			1		1			1			148	4.7
105-120	37	34	31	17	12	10	6	1										148	4.7
120-135	37	42	41	13	9	2	1	1										146	4.6
135-150	32	36	26	8	3	1												106	3.3
150-165	27	19	10	1			1											58	1.8
165-180	41	39	15	4			1											100	3.1
180-195	43	25	18	8		1												95	3.0
195-210	29	28	5	2	1	1	1											67	2.1
210-225	27	12	3		1													43	1.4
225-240	21	21	20	5														67	2.1
240-255	38	39	22	9	4	1												113	3.6
255-270	43	46	62	23	17	10	5	5	1		1			1				214	6.7
270-285	45	60	79	68	21	19	5	2	1				1					301	9.5
285-300	34	54	83	36	34	3	4	2				1						251	7.9
300-315	36	70	60	36	9	2	1											214	6.7
315-330	28	25	38	16		1	1											109	3.4
330-345	16	19	10	5		1												51	1.6
345-360	21	30	29	9	3		2											94	3.0

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	729	776	695	375	163	83	35	18	5	2	1	2	4	8	2	0	0	0	0	0		2898
PER.CT.	22.9	24.4	21.9	11.8	5.1	2.6	1.1	0.6	0.2	0.1	0.0	0.1	0.1	0.3	0.1	0.0	0.0	0.0	0.0	0.0		

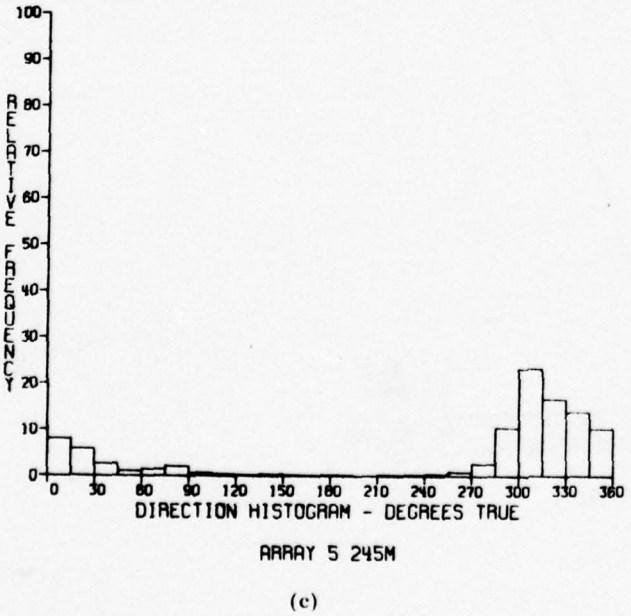
NUMBER OF ZERO SPEED AVERAGES = 280 PERCENTAGE ZERO SPEED AVERAGES = 8.8
TOTAL NUMBER OF OBS. = 3178


TOTAL NUMBER OBS. = 3178
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 5 45M

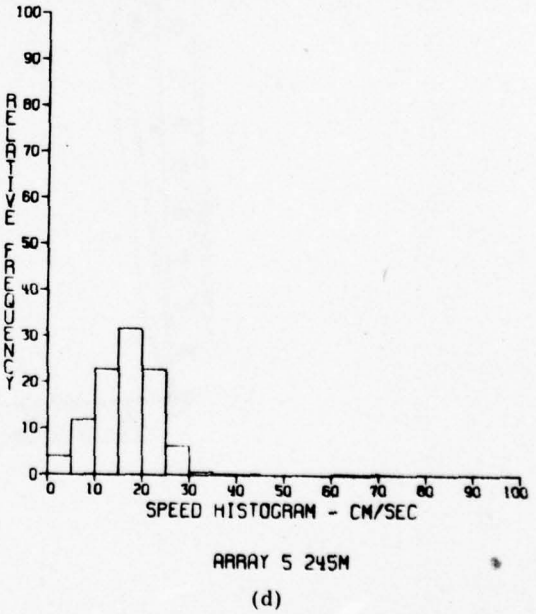
(a)


TOTAL NUMBER OBS. = 3178
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 20 40 60 80 100 120 140 160 180 200
SPEED HISTOGRAM - CM/SEC
ARRAY 5 45M

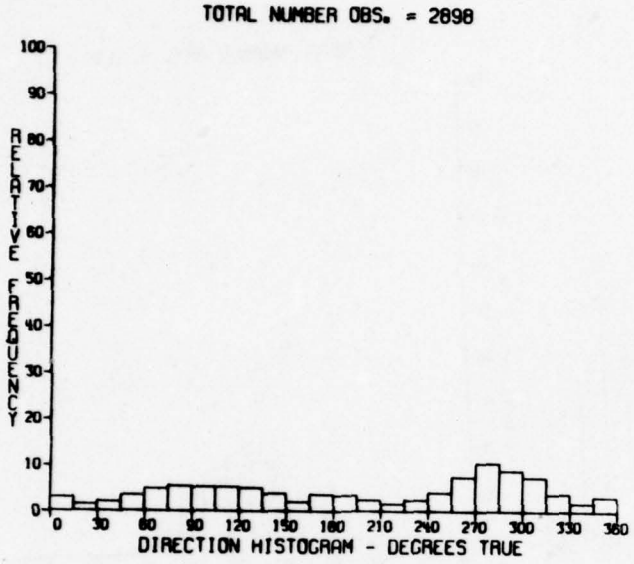
(b)


TOTAL NUMBER OBS. = 3178
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 5 245M

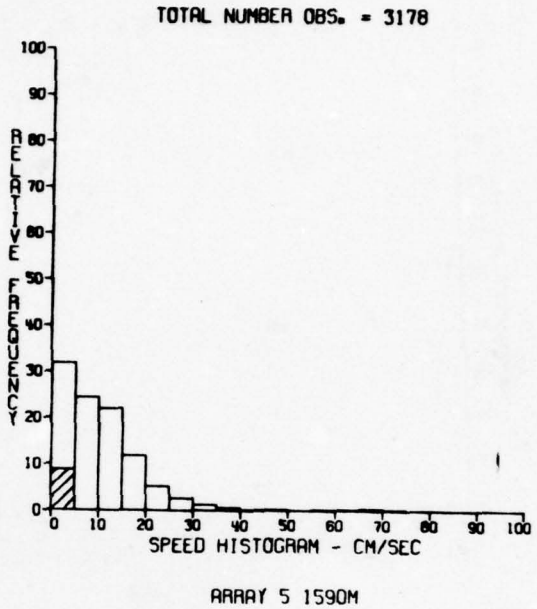
(c)


TOTAL NUMBER OBS. = 3178
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 5 245M

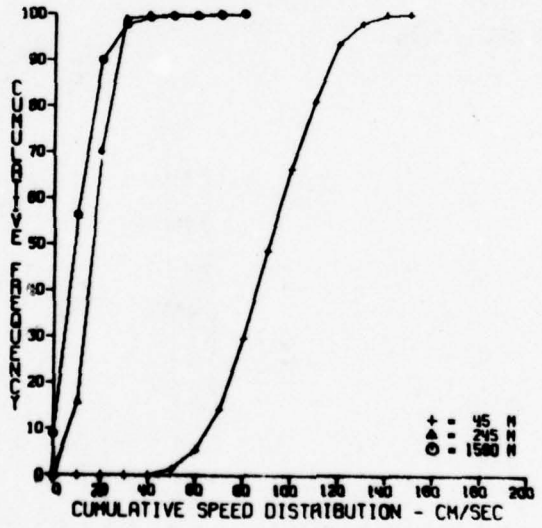
(d)


TOTAL NUMBER OBS. = 2898
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 5 1590M

(a)

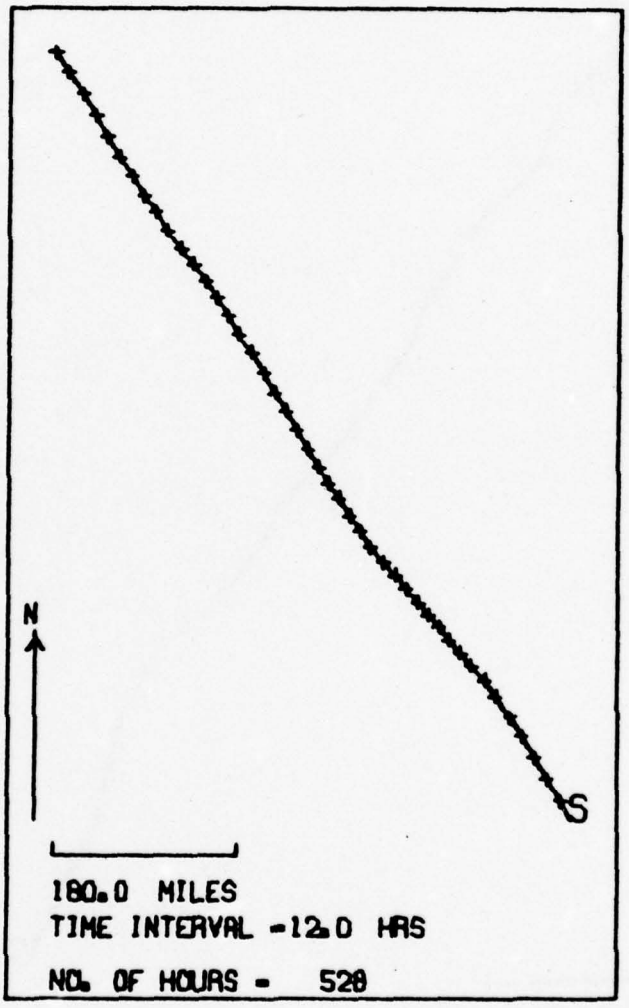

TOTAL NUMBER OBS. = 3178
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 5 1590M

(b)

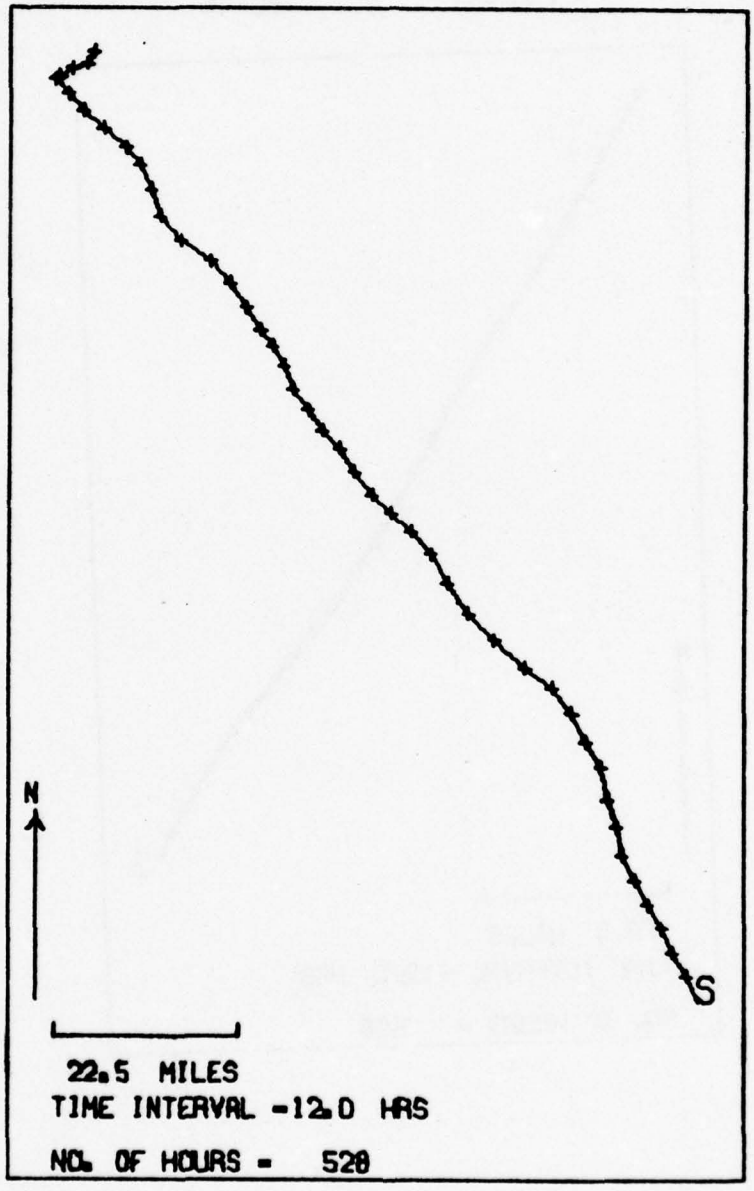

+ = 45 M
▲ = 245 M
⊙ = 1580 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 5

(c)

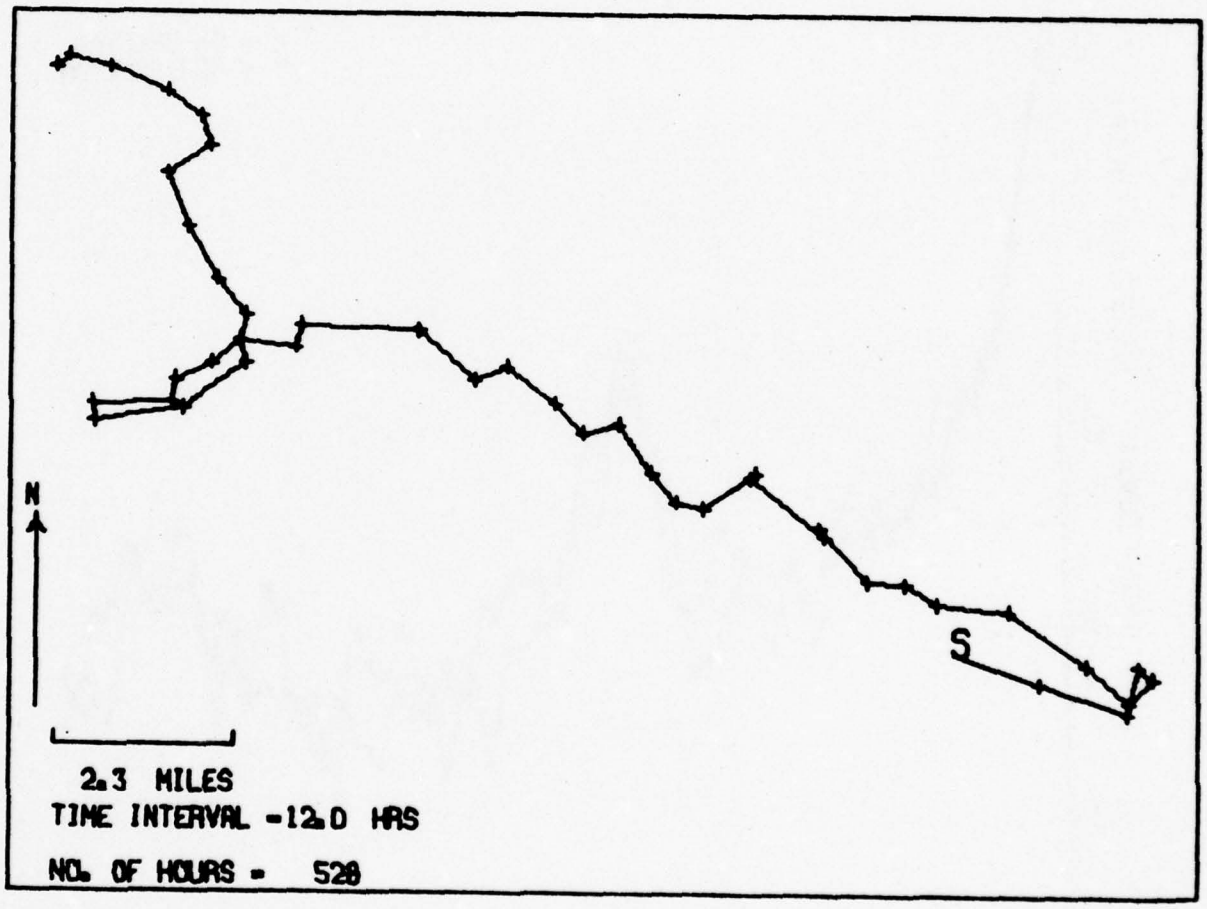
ARRAY 5 45 M

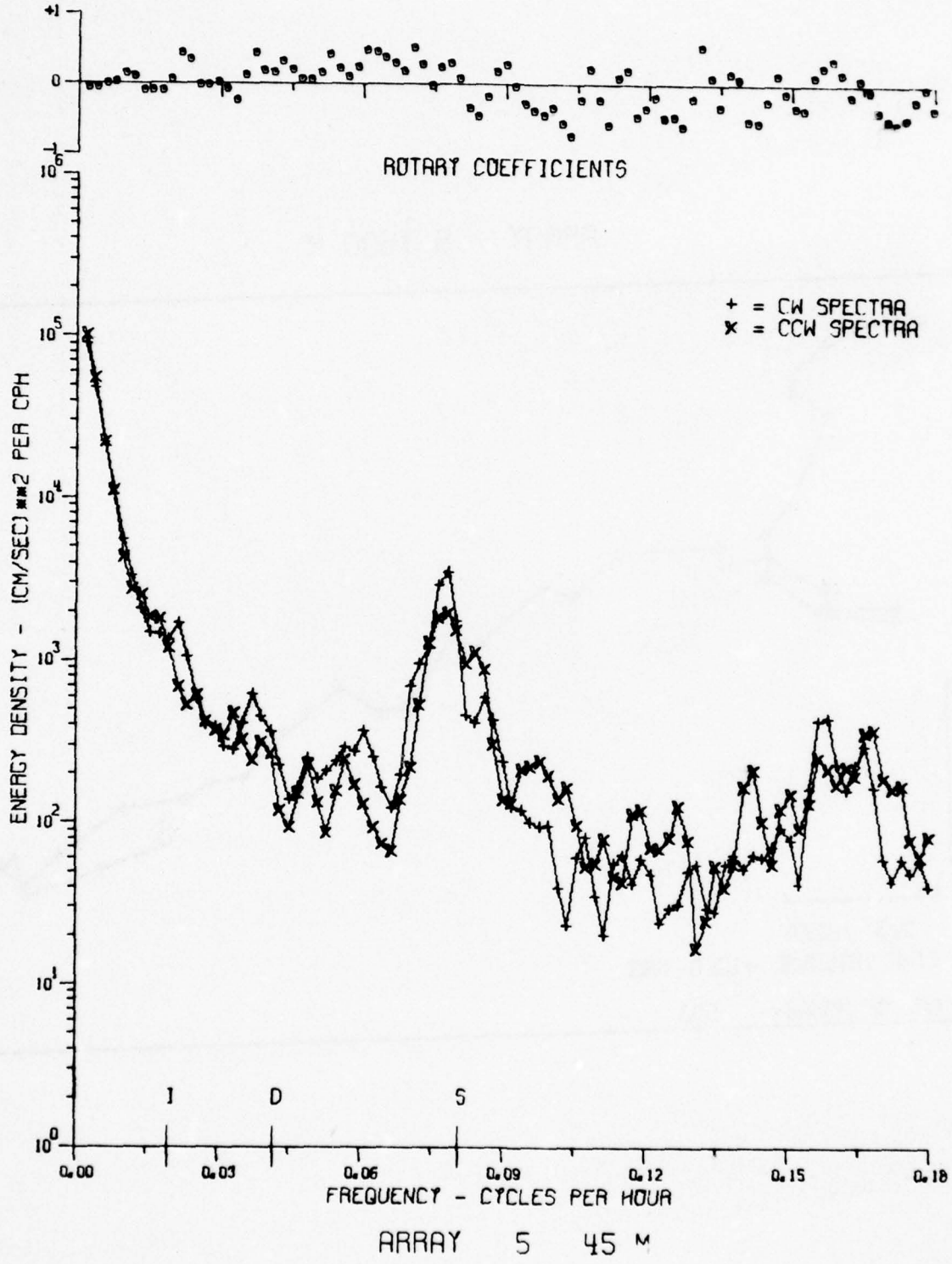


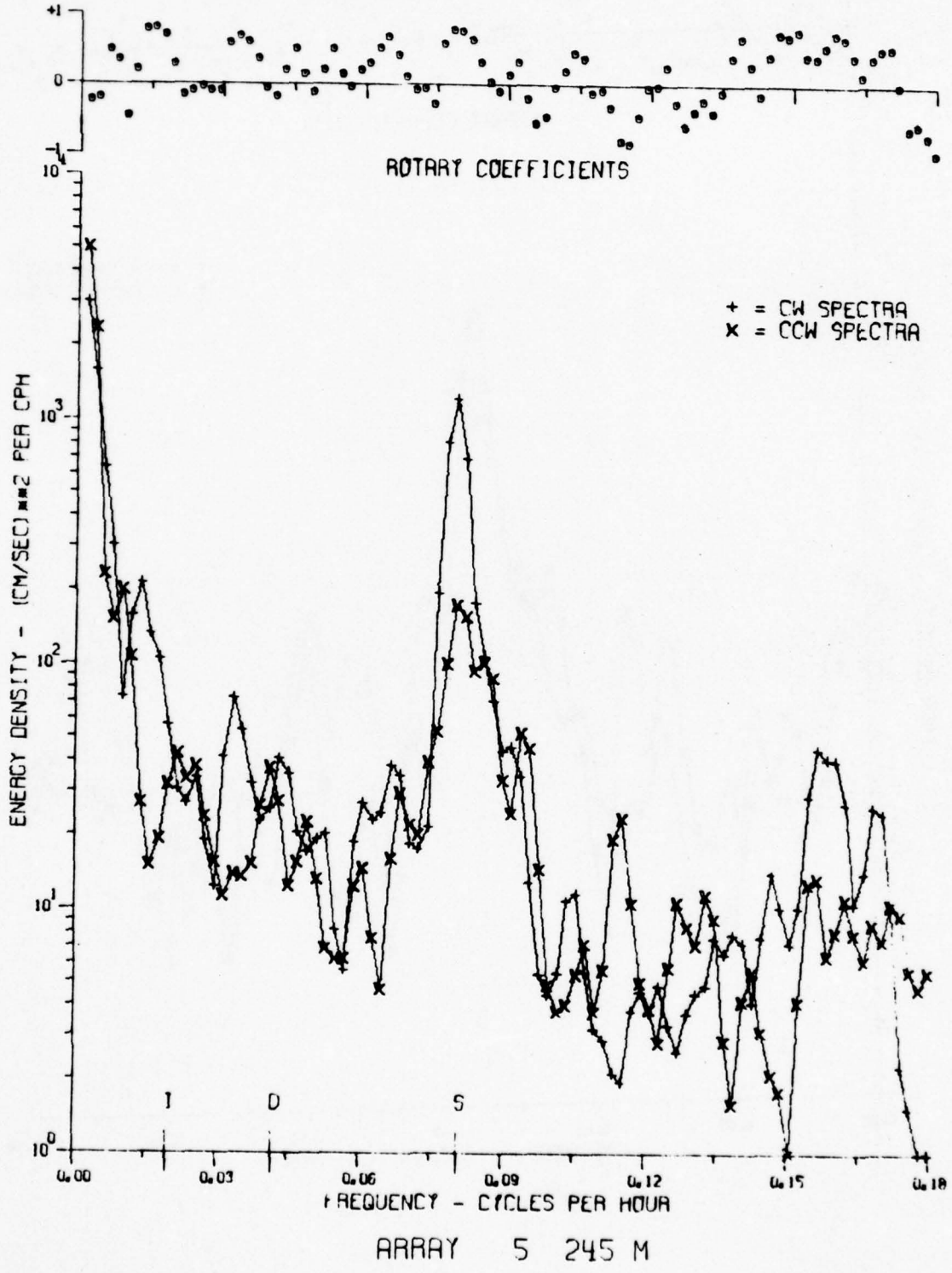
ARRAY 5 245 M

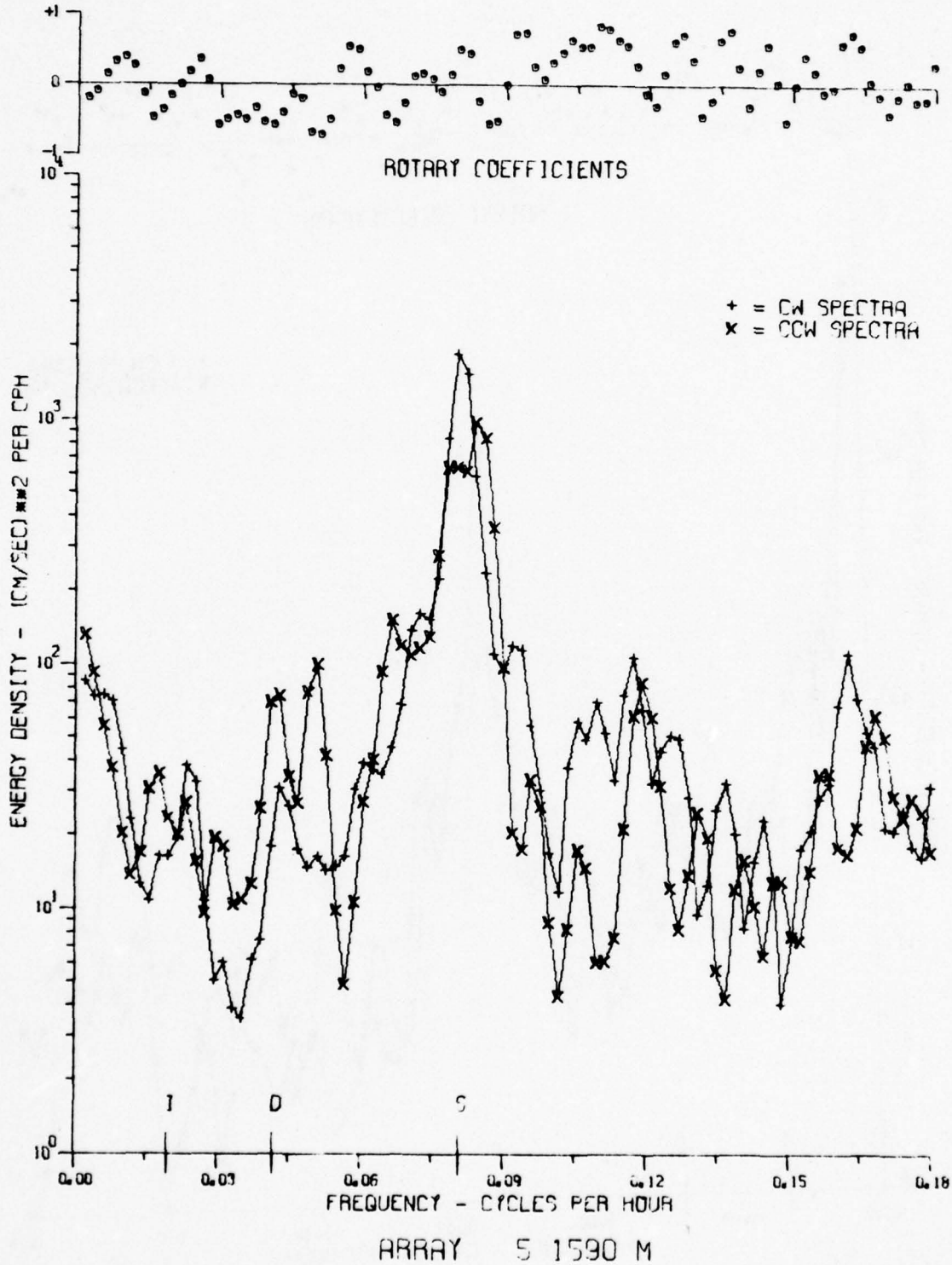


ARRAY 5 1590 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 5 45 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 5 245 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
× = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 5 1590 M

ARRAY 6

CARIB EPS 13 37 48N 60 59 42W FILM 803 START TIME 2000Z 07/12/72 WATER DEPTH=
600M SAMPLE DEPTH=45M SAMPLE RATE 10MIN RECORD LENGTH=545 HOURS

DIRECTION														SUM	PER.CT.
0- 15		2	4			5								11	0.3
15- 30	1	1												2	0.1
30- 45														0	0.0
45- 60														0	0.0
60- 75														0	0.0
75- 90	1													1	0.0
90-105														0	0.0
105-120	1	1	1											3	0.1
120-135	1		2											3	0.1
135-150									1	1				2	0.1
150-165		2	1		2				1					6	0.2
165-180	2		1	1	4			1	2	1				12	0.4
180-195		4			3	1	1							9	0.3
195-210		2												2	0.1
210-225														0	0.0
225-240					1									1	0.0
240-255		1	2						1					4	0.1
255-270				4										4	0.1
270-285				6	18	10	19	1	3		2			59	1.8
285-300	1	3	4	32	72	59	66	50	50	65	60	21	6	489	14.9
300-315	2	11	19	37	159	211	367	352	260	159	58	10	3	1648	50.3
315-330	3	14	34	56	201	181	171	70	30	11	1	1		779	23.8
330-345	2	18	21	18	81	38	16	3						197	6.0
345-360		6	8	3	13	7								37	1.1

SPEED	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	
SUM	14	65	97	157	554	512	640	477	354	237	121	32	9	0	0	0	0	0	0	0	0	3269
PER.CT.	0.4	2.0	3.0	4.8	16.9	15.6	19.5	14.6	10.8	7.2	3.7	1.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

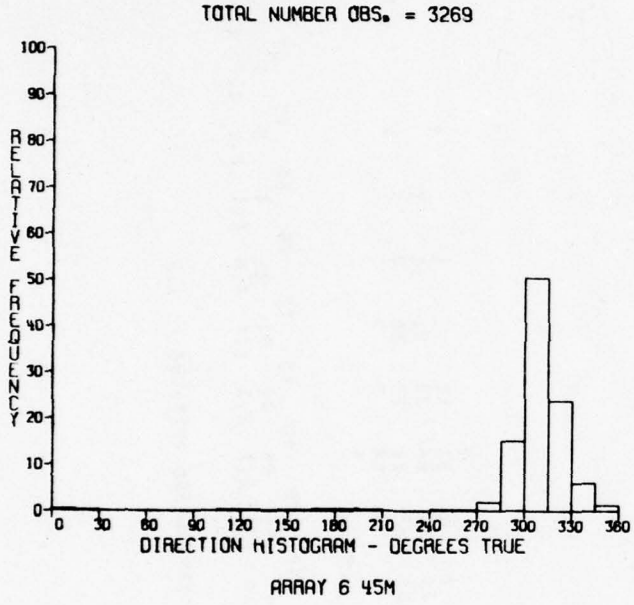
NUMBER OF ZERO SPEED AVERAGES = 7 PERCENTAGE ZERO SPEED AVERAGES = 0.2
TOTAL NUMBER OF OBS. = 3276

CARIB OBS 13 37 48N 60 59 42W FILM 795 START TIME 2000Z 07/12/72 WATER DEPTH=
60CM SAMPLE DEPTH=590M SAMPLE RATE 10MIN RECORD LENGTH=546 HOURS

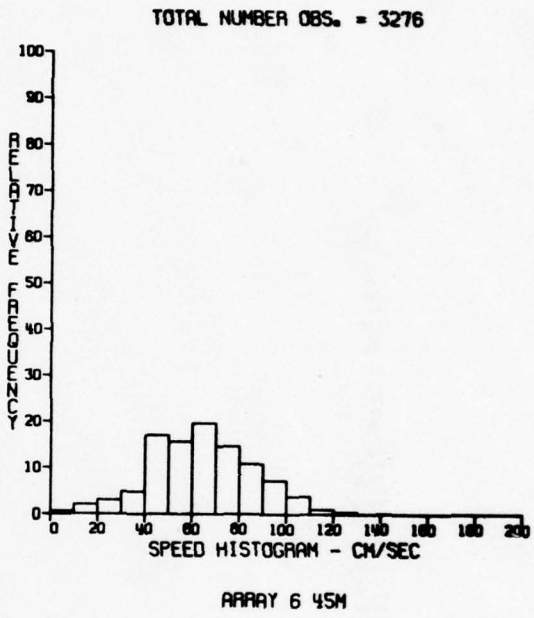
DIRECTION																						SUM	PER.CT.
0- 15	8	9	14	8							3											42	1.3
15- 30	6	2	2	2																		12	0.4
30- 45	6	7	1																			14	0.4
45- 60	10	7	2	1																		20	0.6
60- 75	6	6	1		1																	14	0.4
75- 90	1	9		1																		11	0.3
90-105	6	11	1	3		3																24	0.7
105-120	13	25	19	14	3	6	1	1	1													83	2.5
120-135	15	40	34	56	26	14	8	3	3													199	6.1
135-150	9	25	46	58	39	22	13	5	1	1												219	6.7
150-165	12	38	36	46	35	26	11	4	1													209	6.4
165-180	18	71	113	115	54	9	2	1														383	11.7
180-195	16	46	83	76	33	5																259	7.9
195-210	4	31	40	13	8	3																99	3.0
210-225	17	16	19	14	5	3	4															78	2.4
225-240	13	27	24	9	3																	76	2.3
240-255	9	28	14	2																		53	1.6
255-270	9	13	5																			27	0.8
270-285	7	12	2									4										25	0.8
285-300	13	24	26	22	11	4	1		1	2	2	21	10		1		1					139	4.2
300-315	6	23	38	78	48	47	40	19	20	31	30	24	22	21	11	1						459	14.0
315-330	9	10	14	22	13	27	51	63	64	50	47	22	38	30	9	3	1		3	2		478	14.6
330-345	10	16	24	35	25	28	20	13	4	1	2	14	2	2							2	198	6.0
345-360	14	23	25	30	15	7			1			4										119	3.6

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	237	519	983	805	319	204	151	109	96	85	84	89	72	53	21	4	2	0	3	4		3240
PER.CT.	7.2	15.8	17.8	18.5	9.7	6.2	4.6	3.3	2.9	2.6	2.6	2.7	2.2	1.6	0.6	0.1	0.1	0.0	0.1	0.1		

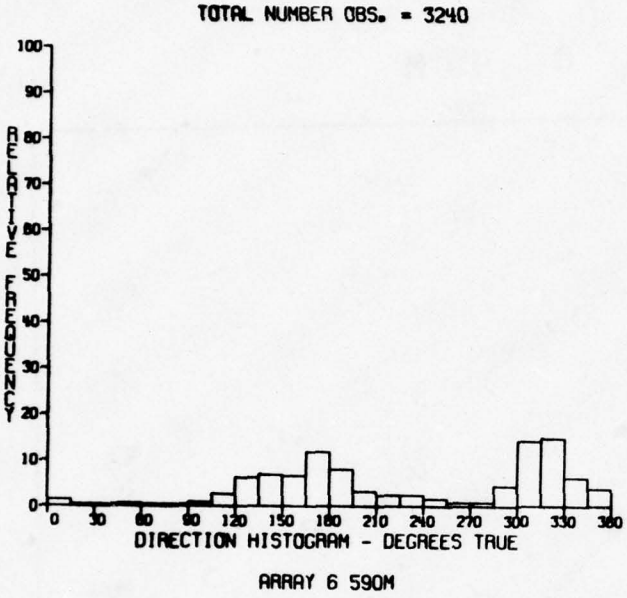
NUMBER OF ZERO SPEED AVERAGES = 38 PERCENTAGE ZERO SPEED AVERAGES = 1.2
TOTAL NUMBER OF OBS. = 3278


TOTAL NUMBER OBS. = 3269
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 6 45M

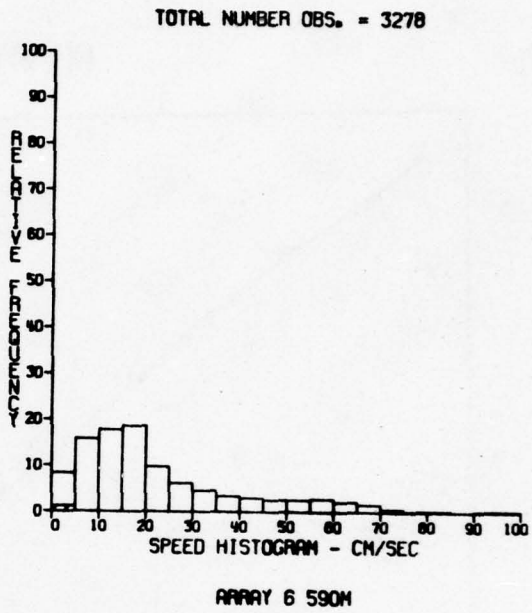
(a)


TOTAL NUMBER OBS. = 3276
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 20 40 60 80 100 120 140 160 180 200
SPEED HISTOGRAM - CM/SEC
ARRAY 6 45M

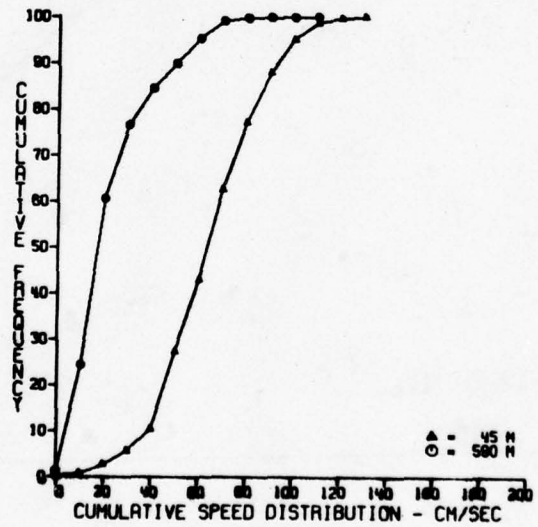
(b)


TOTAL NUMBER OBS. = 3240
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 6 590M

(a)

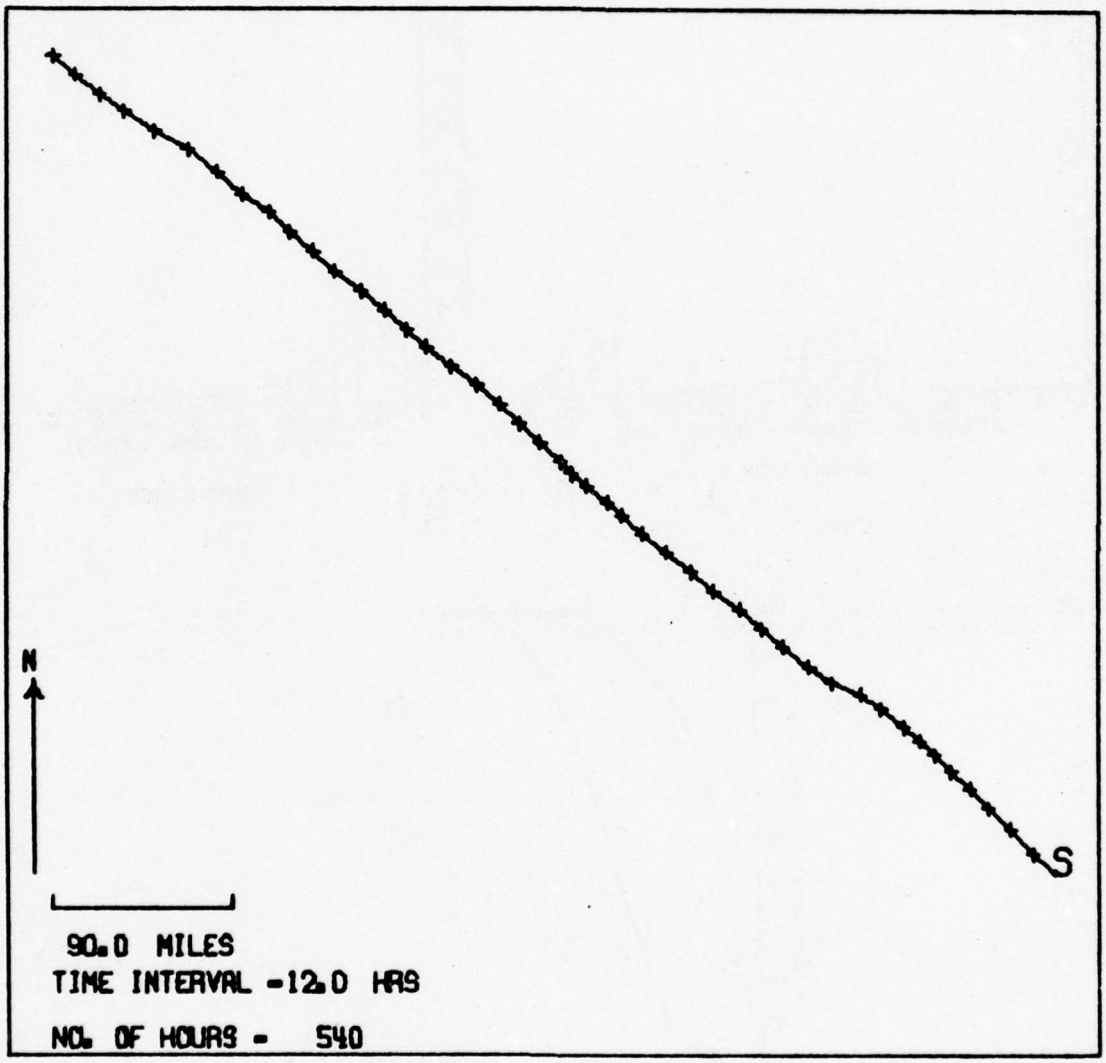

TOTAL NUMBER OBS. = 3278
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 6 590M

(b)

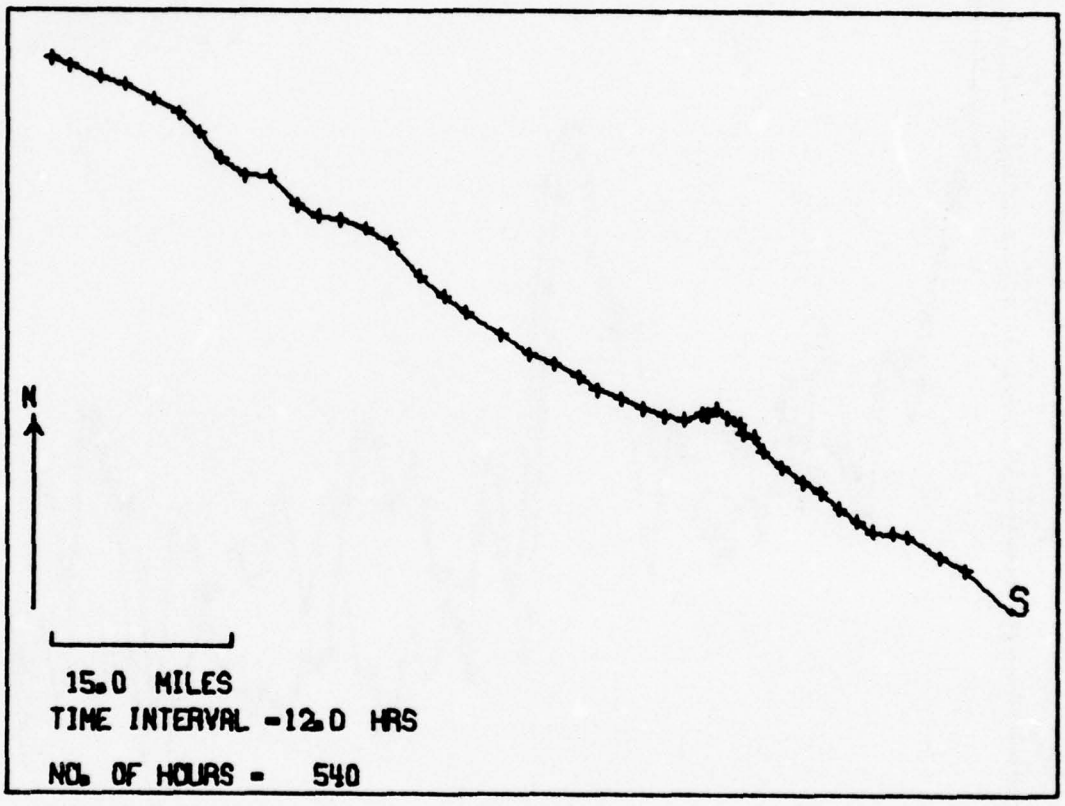

CUMULATIVE FREQUENCY
▲ = 45 M
○ = 590 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 6

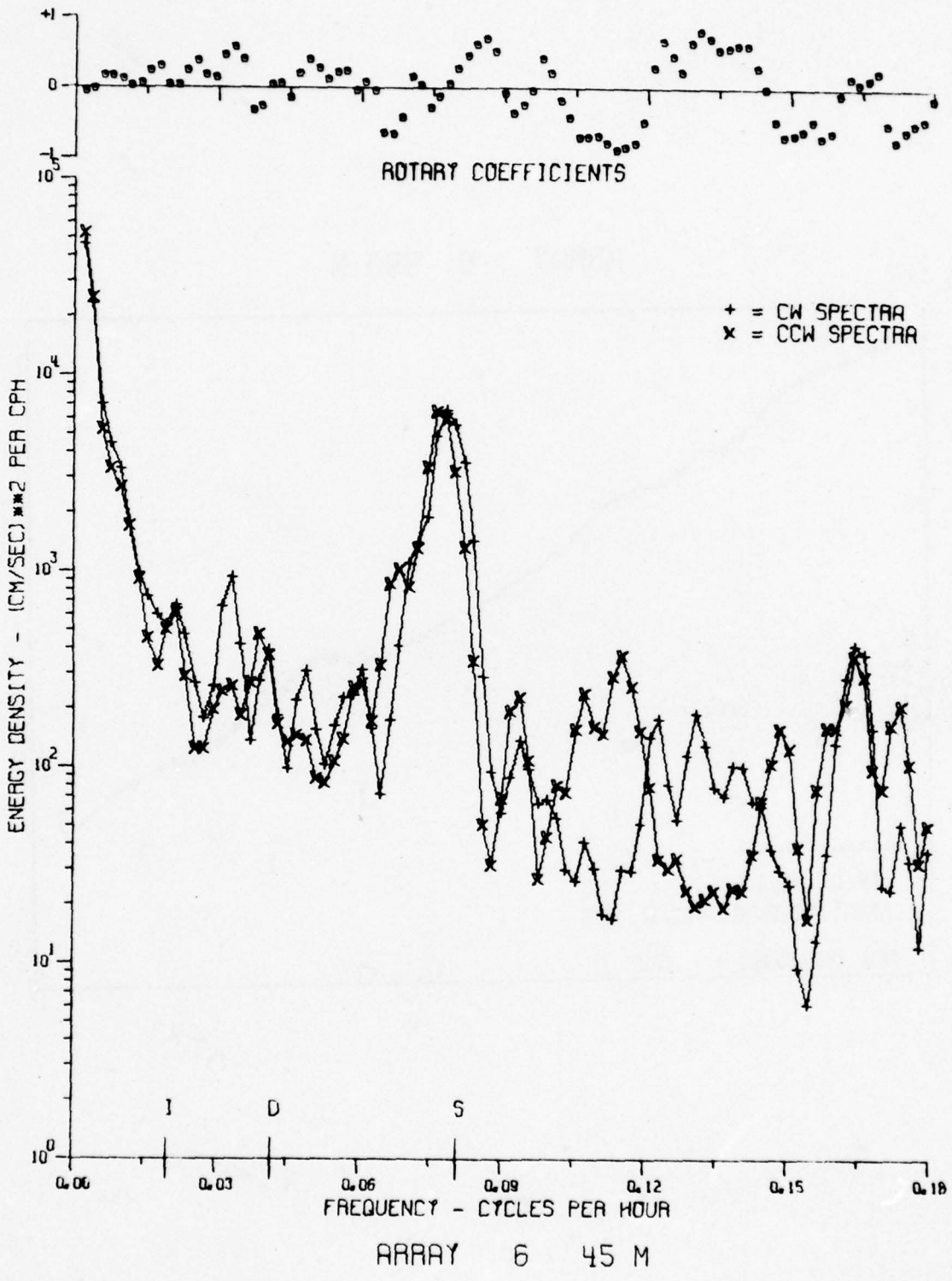
(c)

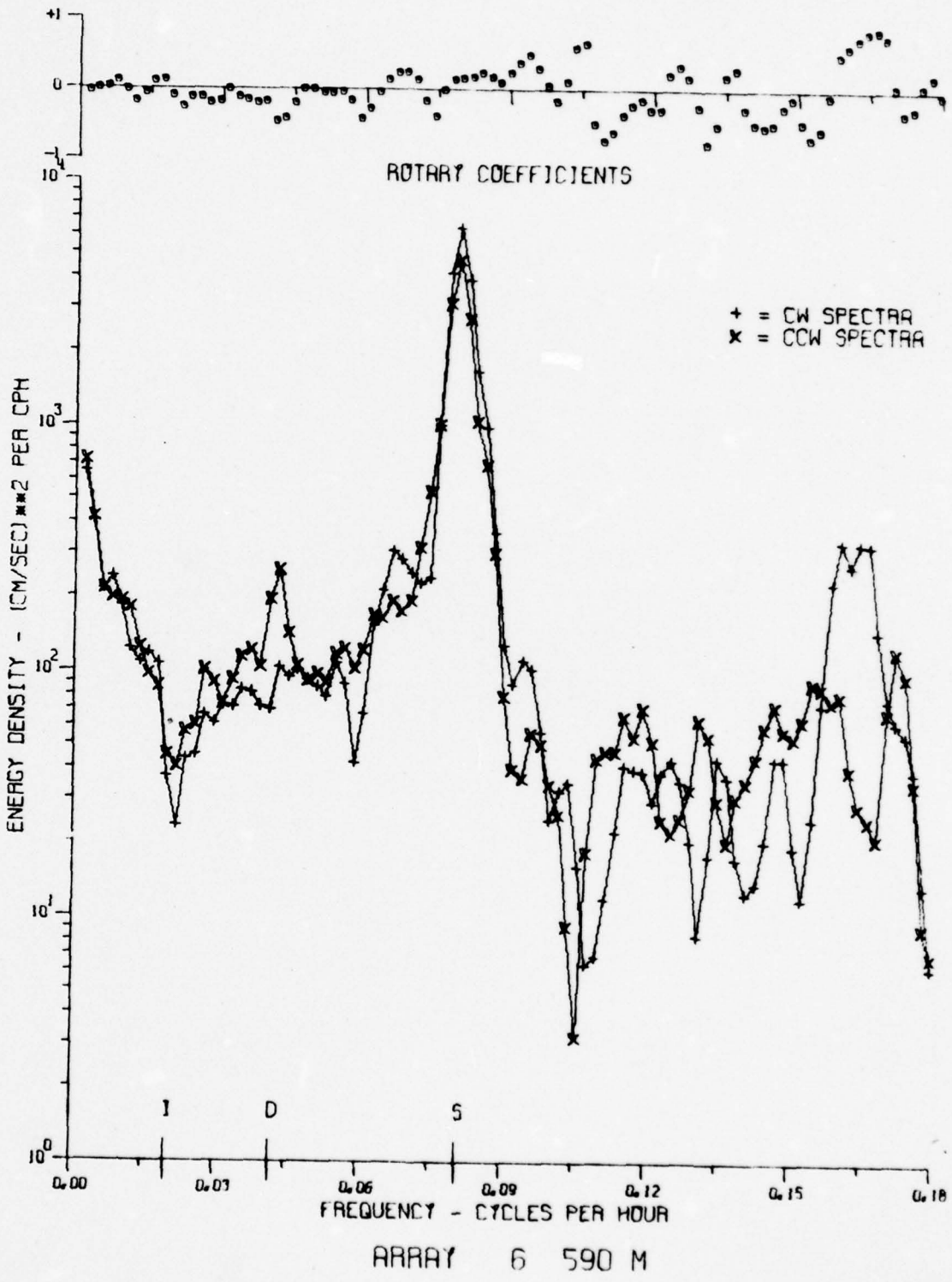
ARRAY 6 45 M



ARRAY 6 590 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^4
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 6 45 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 6 590 M

ARRAY 7

CARIB 6PS 14 19 18N 60 54 42W FILM 805 START TIME 1200Z 07/12/72 WATER DEPTH =1
C3C SAMPLE DEPTH= 45M SAMPLE RATE 10MIN RECORD LENGTH = 338 HOURS

DIRECTION																	SUM	PER.CT.
0- 15								5	2								7	0.3
15- 30																	0	0.0
30- 45																	0	0.0
45- 60																	0	0.0
60- 75																	0	0.0
75- 90																	0	0.0
90-105																	0	0.0
105-120																	0	0.0
120-135																	0	0.0
135-150																	0	0.0
150-165																	0	0.0
165-180																	0	0.0
180-195																	0	0.0
195-210																	0	0.0
210-225																	0	0.0
225-240							2	2	1								5	0.2
240-255				2	1	1	8	6	1	1	6	3	6	2			37	1.8
255-270			2		1	8	11	13	9	13	13	15	12	3			100	4.9
270-285	1	1	3	6	9	26	27	44	34	67	90	130	93	52	3	1	587	28.9
285-300		1	3	5	13	27	51	34	45	91	173	254	197	73	10	1	978	48.1
300-315			2		6	13	20	27	37	62	48	37	7	2			261	12.8
315-330			1	2	2	4	9	14	10	6	1	1	1				51	2.5
330-345				1				1	1		1		1		2		7	0.3
345-360										1							1	0.0

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	1	2	11	16	32	79	128	141	143	243	332	440	317	132	15	2	0	0	0	0		2034
PER.CT.	0.0	0.1	0.5	0.8	1.6	3.9	6.3	6.9	7.0	11.9	16.3	21.6	15.6	6.5	0.7	0.1	0.0	0.0	0.0	0.0		

NUMBER OF ZERO SPEED AVERAGES = 0 PERCENTAGE ZERO SPEED AVERAGES = 0.0
TOTAL NUMBER OF OBS. = 2034

CARIB 6PS 14 19 18N 60 54 42W FILM 804 START TIME 1200Z 07/12/72 WATER DEPTH =1
C30M SAMPLE DEPTH= 24?M SAMPLE RATE 10MIN RECORD LENGTH = 348 HOURS

DIRECTION																		SUM	PER.CT.
0- 15														1	4	2		7	0.3
15- 30																		0	0.0
30- 45																		0	0.0
45- 60																		0	0.0
60- 75																		0	0.0
75- 90																		0	0.0
90-105																		0	0.0
105-120																		0	0.0
120-135																		0	0.0
135-150																		0	0.0
150-165																		0	0.0
165-180																		0	0.0
180-195			1	1														2	0.1
195-210			5	4	3	5	3	1										21	1.0
210-225		1	3	5	3	1	5	5		1								24	1.1
225-240			1	1	3	2	4	12	5	3								31	1.5
240-255			4		7	16	15	12	12									66	3.2
255-270			1	4	40	102	99	70	39	15	5	2						377	18.0
270-285			4	23	64	106	151	162	126	103	57	31	12	2				841	40.2
285-300			1	20	40	88	100	94	67	46	24	8						488	23.3
300-315			1	14	36	61	33	14	17	4						3		183	8.7
315-330			3	3	9	19	15		1	1								51	2.4
330-345			1															1	0.0
345-360				1	1													2	0.1

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	1	25	76	206	400	425	370	267	173	86	41	12	2	0	3	0	1	4	2	0		2094
PER.CT.	0.0	1.2	3.6	9.8	19.1	20.3	17.7	12.8	8.3	4.1	2.0	0.6	0.1	0.0	0.1	0.0	0.0	0.2	0.1	0.0		

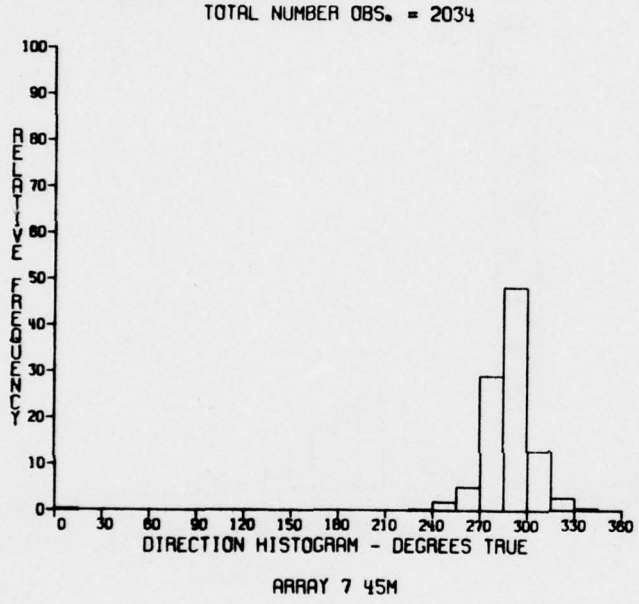
NUMBER OF ZERO SPEED AVERAGES = 0 PERCENTAGE ZERO SPEED AVERAGES = 0.0
TOTAL NUMBER OF OBS, = 2094

CARIB 0PS 14 19 18N 6C 54 42W FILM 800 START TIME 1200Z 07/12/72 WATER DEPTH= =1
C3CM SAMPLE DEPTH=101CM SAMPLE RATE 20MIN RECORD LENGTH = 538 HOURS

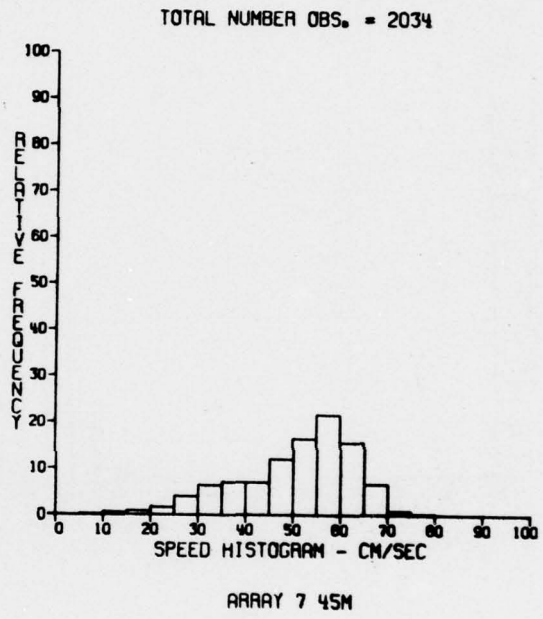
DIRECTION														SUM	PER.CT.
0- 15	1	3	1		1				8					14	0.9
15- 30	5		5		2									12	0.7
30- 45	2	5	3	1	3									14	0.9
45- 60	2	7	2	2	2									15	0.9
60- 75	7	11	12	4	3									37	2.3
75- 90	9	26	27	11	9	2			1					85	5.3
90-105	8	31	27	17	13	9	3	1						109	6.7
105-120	6	20	33	18	11	10	4	2						104	6.4
120-135	12	34	51	22	26	6	2							153	9.5
135-150	11	25	30	31	24	8	3	1						133	8.2
150-165	7	16	11	5	14	9	5							67	4.1
165-180	6	15	10	6	3	3		3	1					47	2.9
180-195	6	9	5	5				1				1		27	1.7
195-210	8	12	5											25	1.5
210-225	6	5	2	1	2									16	1.0
225-240	10	9	7	4	2		2	1	1					36	2.2
240-255	6	10	14	13	17	11	4	5	1			1		82	5.1
255-270	11	10	18	22	20	36	27	20	20	11	3	4		202	12.5
270-285	9	18	28	35	27	36	46	33	25	12	3	1	1	274	16.9
285-300	5	8	8	8	14	20	13	5	2	4	2			89	5.5
300-315	6	5	9	4	7	2	1							34	2.1
315-330	1	10	4	3		2	1							21	1.3
330-345	1	2	1		3	1								8	0.5
345-360		5	1											6	0.4

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	145	296	314	212	203	155	111	72	59	27	8	7	1	0	0	0	0	0	0	0	0	1610
PER.CT.	9.0	18.3	19.4	13.1	12.5	9.6	6.9	4.4	3.6	1.7	0.5	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

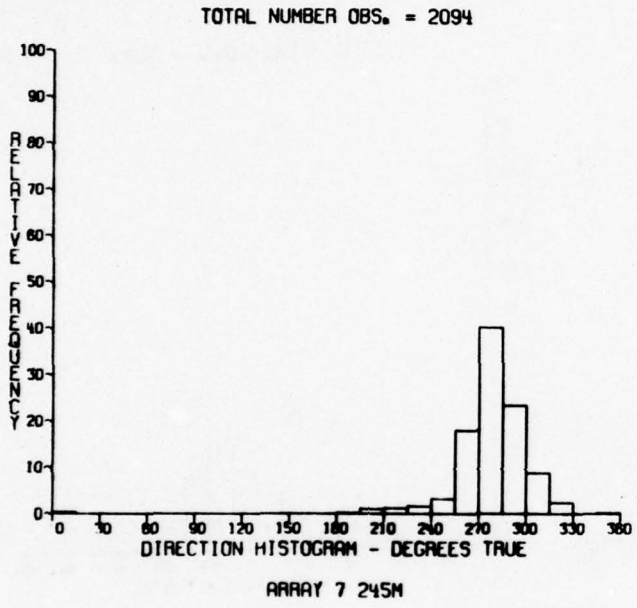
NUMBER OF ZERO SPEED AVERAGES = 8 PERCENTAGE ZERO SPEED AVERAGES = 0.5
TOTAL NUMBER OF OBS. = 1618


TOTAL NUMBER OBS. = 2034
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 7 45M

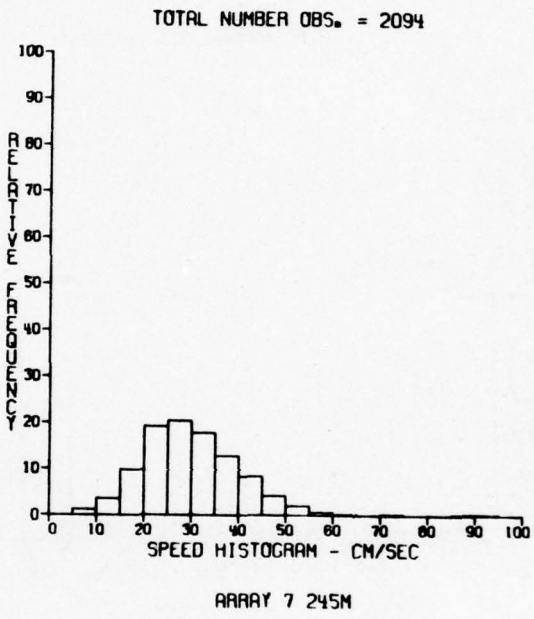
(a)


TOTAL NUMBER OBS. = 2034
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 7 45M

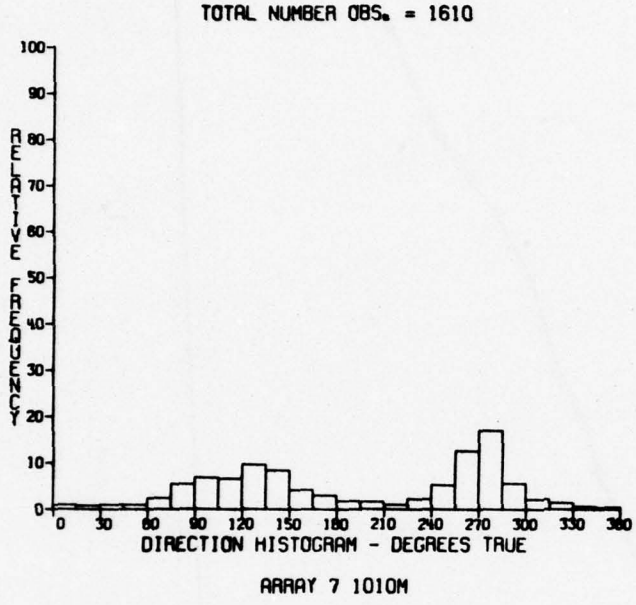
(b)


TOTAL NUMBER OBS. = 2094
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 7 245M

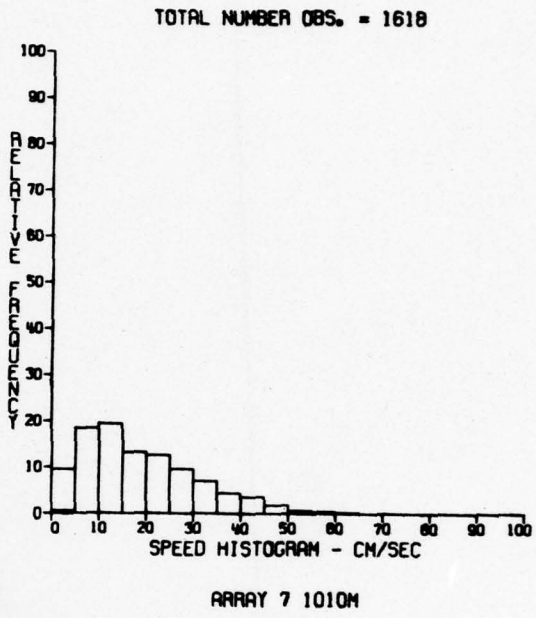
(a)


TOTAL NUMBER OBS. = 2094
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 7 245M

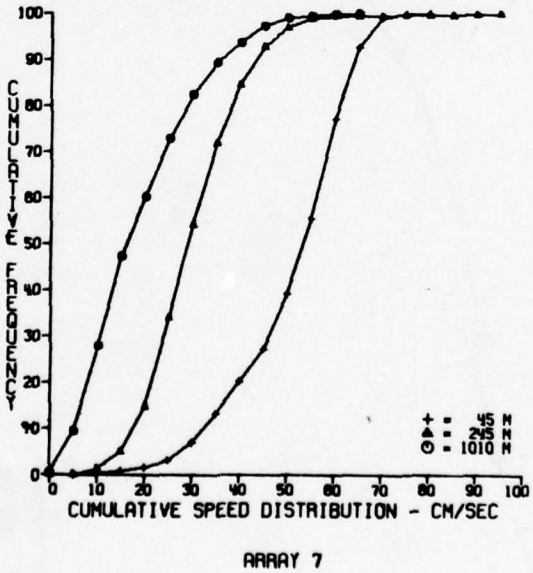
(b)


TOTAL NUMBER OBS. = 1610
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 7 1010M

(a)

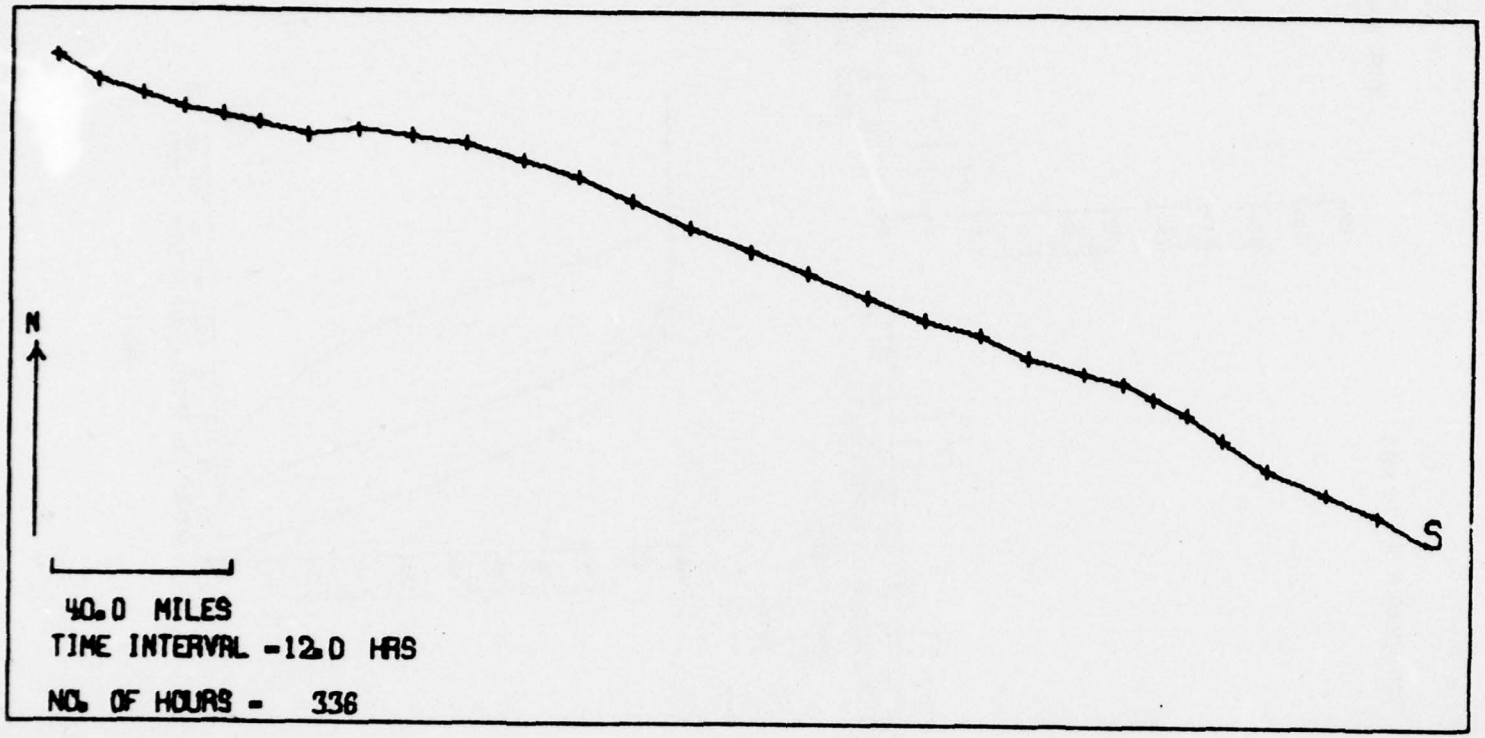

TOTAL NUMBER OBS. = 1618
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 7 1010M

(b)

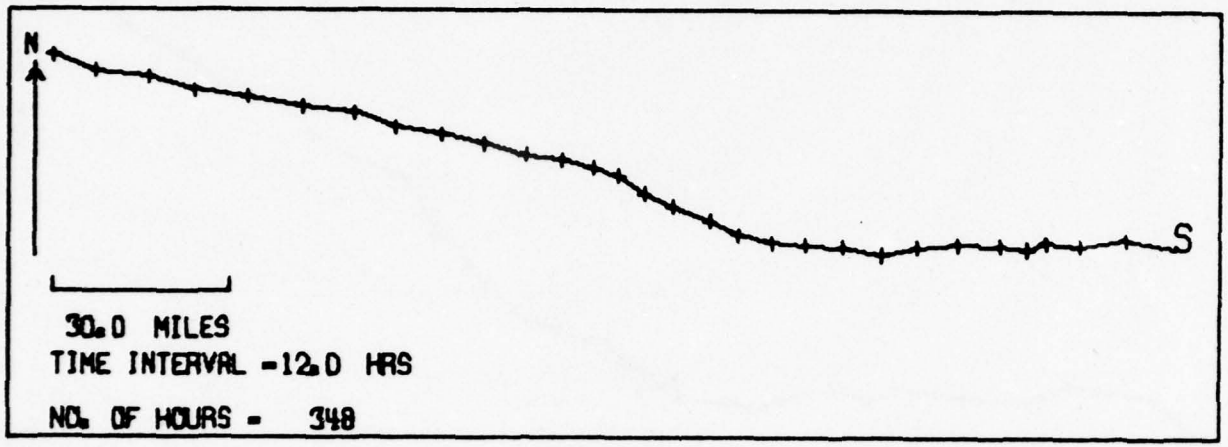

CUMULATIVE FREQUENCY
+ = 45 M
▲ = 245 M
⊙ = 1010 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 7

(c)

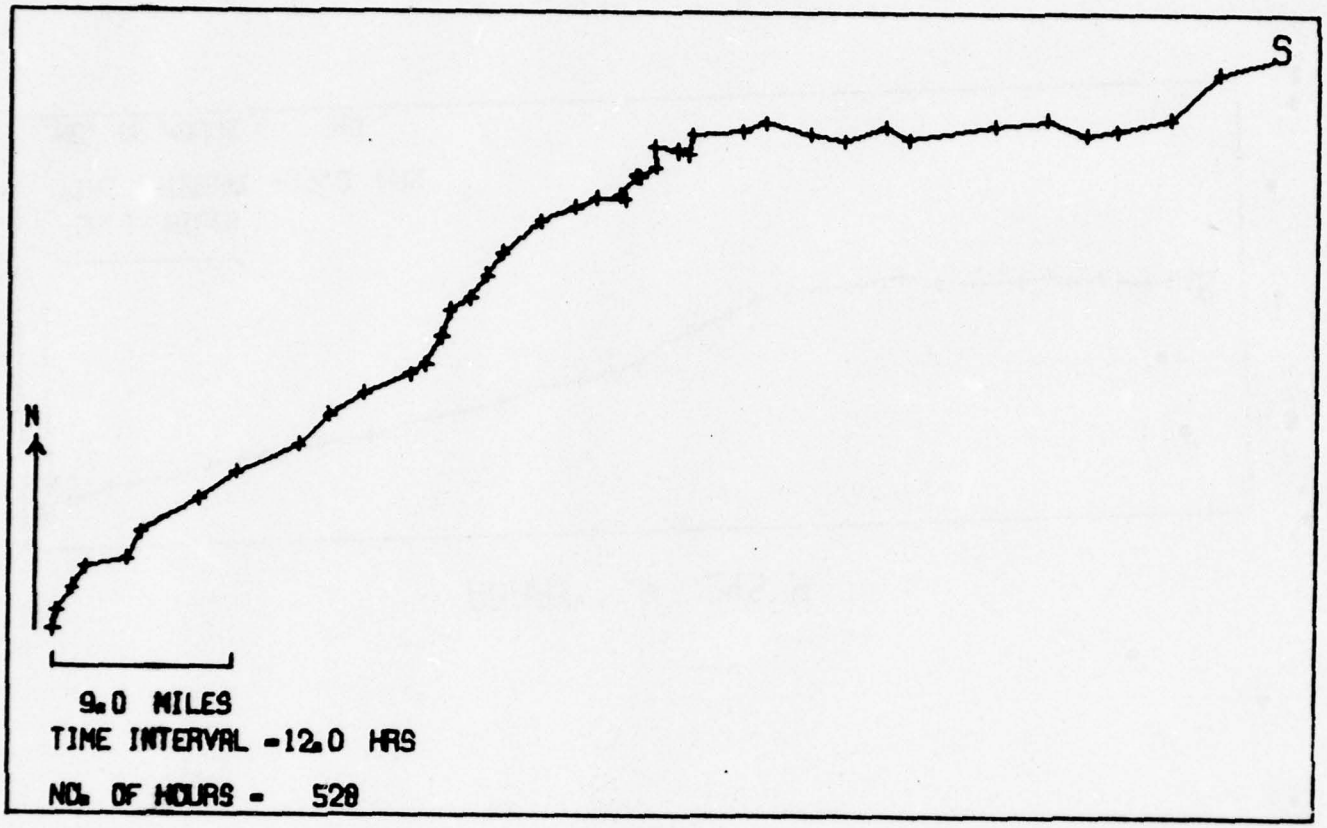
ARRAY 7 45 M

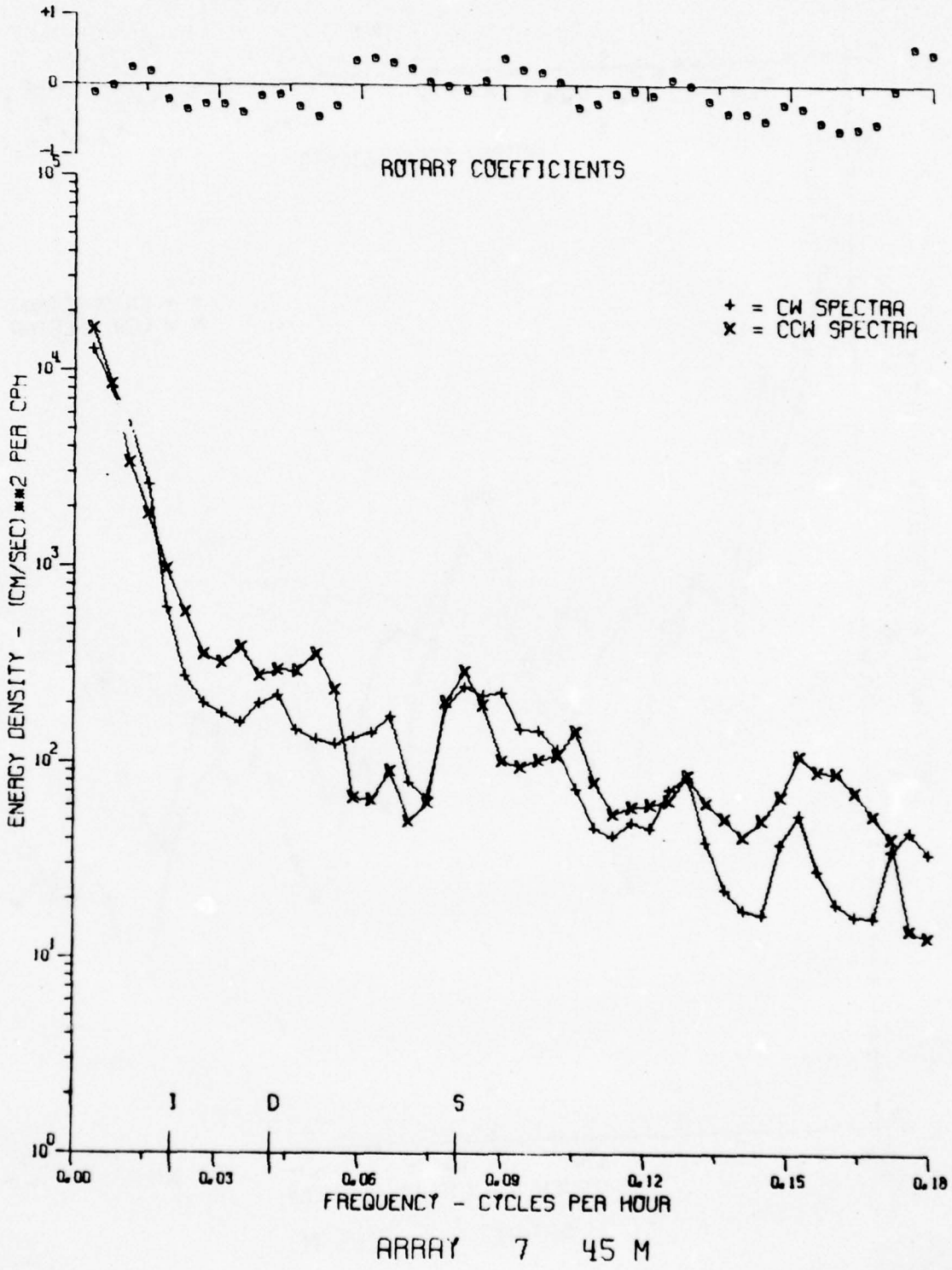


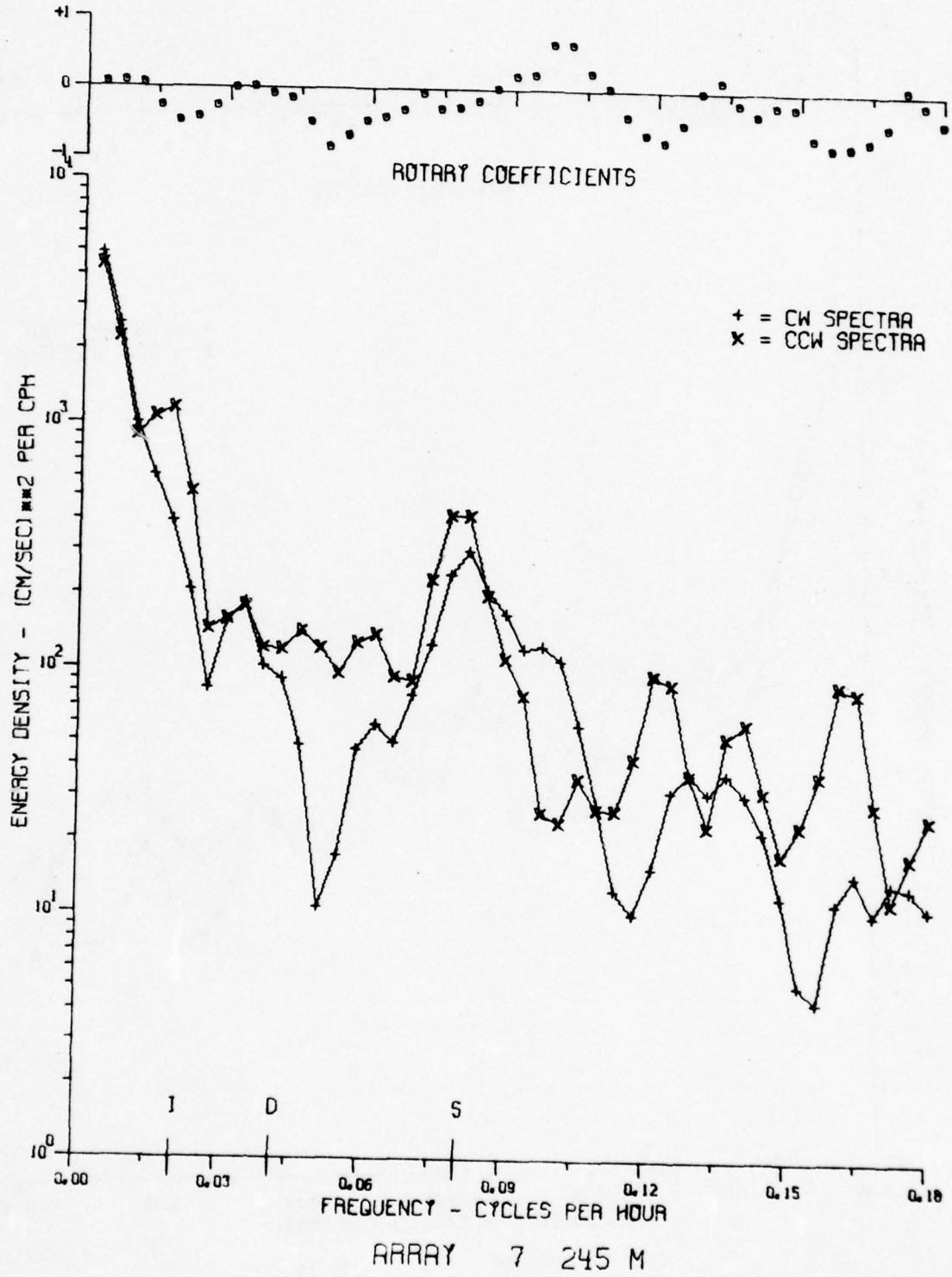
ARRAY 7 245 M

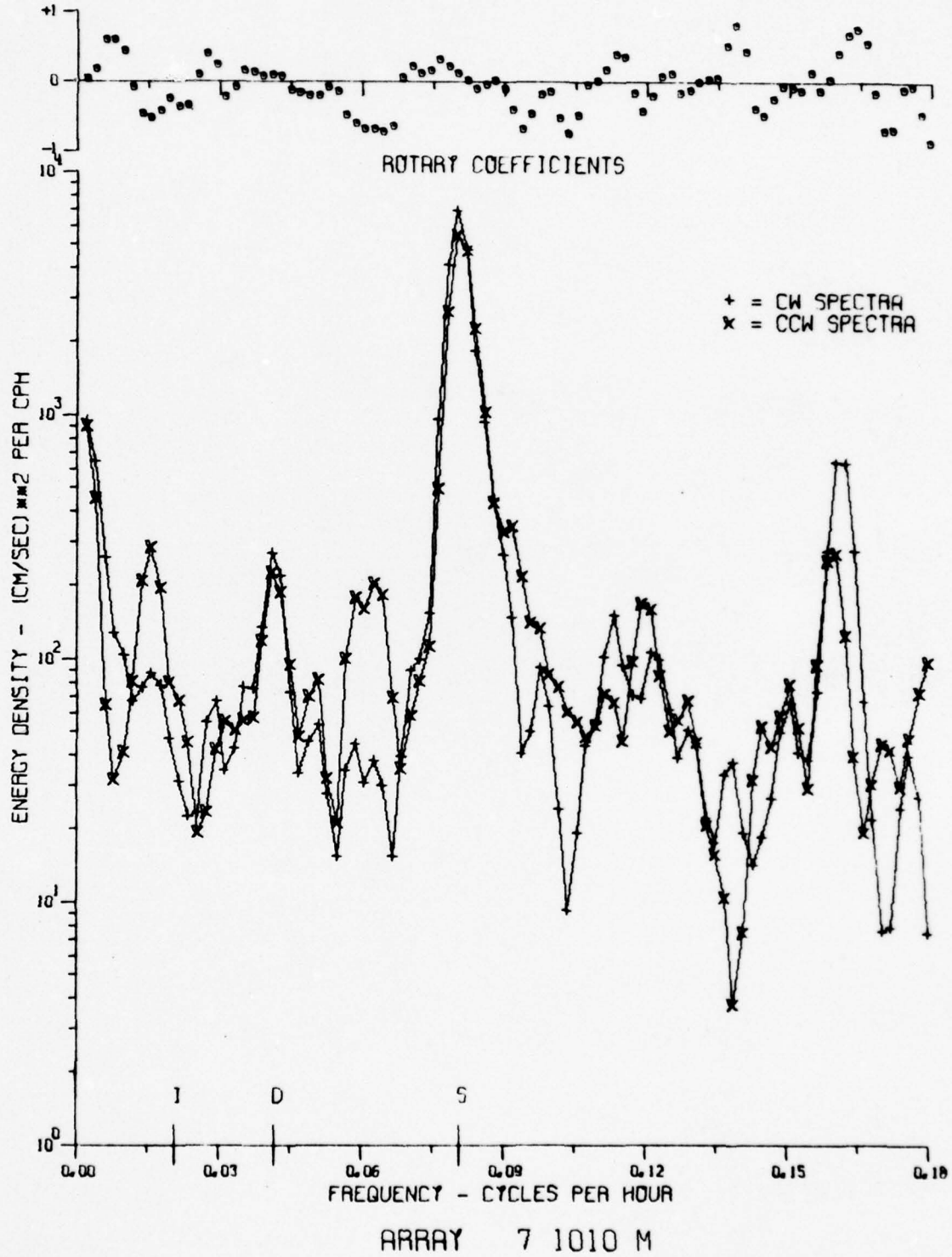


ARRAY 7 1010 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
× = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^5
10^4
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 7 45 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 7 245 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^4
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 7 1010 M

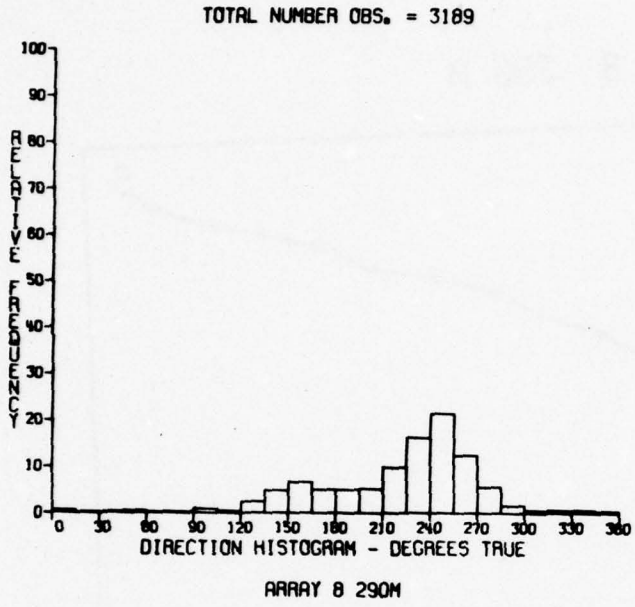
ARRAY 8

CARIB 6PS 15 02 00N 61 15 48W FILM 797 START TIME 1300Z 07/11/72 WATER DEPTH = 2
60M SAMPLE DEPTH= 29CM SAMPLE RATE 10MIN RECORD LENGTH = 546 HOURS

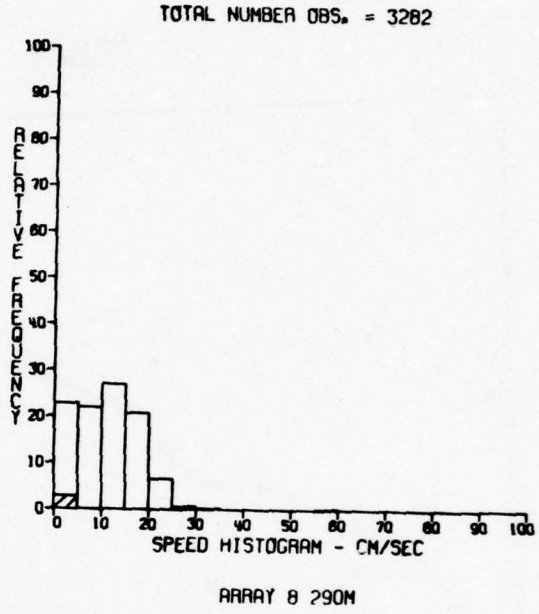
DIRECTION																						SUM	PER.CT.
0- 15	3	4	4																		5	16	0.5
15- 30	1	1	2																			4	0.1
30- 45			3	1																		4	0.1
45- 60		4	5	4																		13	0.4
60- 75	1	3	1	2																		7	0.2
75- 90	1	1	3																			5	0.2
90-105	3	9	11																			23	0.7
105-120	1	3	8																			12	0.4
120-135	4	3	50	17																		74	2.3
135-150	12	24	97	19																		152	4.6
150-165	31	64	100	12																		207	6.3
165-180	36	74	51																			161	4.9
180-195	54	72	28	7																		161	4.9
195-210	47	55	55	9																		166	5.1
210-225	48	70	90	87	15																	310	9.4
225-240	86	97	81	172	67	7	3															513	15.6
240-255	183	109	131	187	55	12	1															678	20.7
255-270	93	65	89	95	50	2																394	12.0
270-285	26	39	31	57	25																	178	5.4
285-300	3	6	27	10	6																	52	1.6
300-315	7	2	4	4																		17	0.5
315-330	6	6	4																			16	0.5
330-345	2	5	9																			16	0.5
345-360	3	6	1																			10	0.3

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	651	722	885	683	218	21	4	0	0	0	0	5	0	0	0	0	0	0	0	0	0	3189
PER.CT.	16.8	22.0	27.0	20.8	6.6	0.6	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

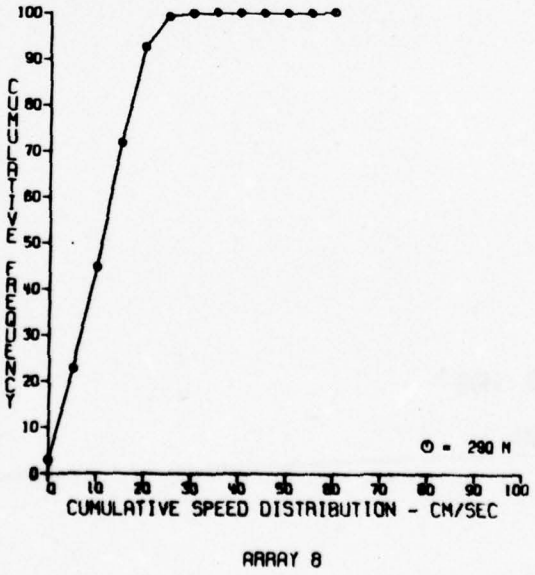
NUMBER OF ZERO SPEED AVERAGES = 93 PERCENTAGE ZERO SPEED AVERAGES = 2.8
TOTAL NUMBER OF OBS. = 3282


TOTAL NUMBER OBS. = 3189
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 8 290M

(a)

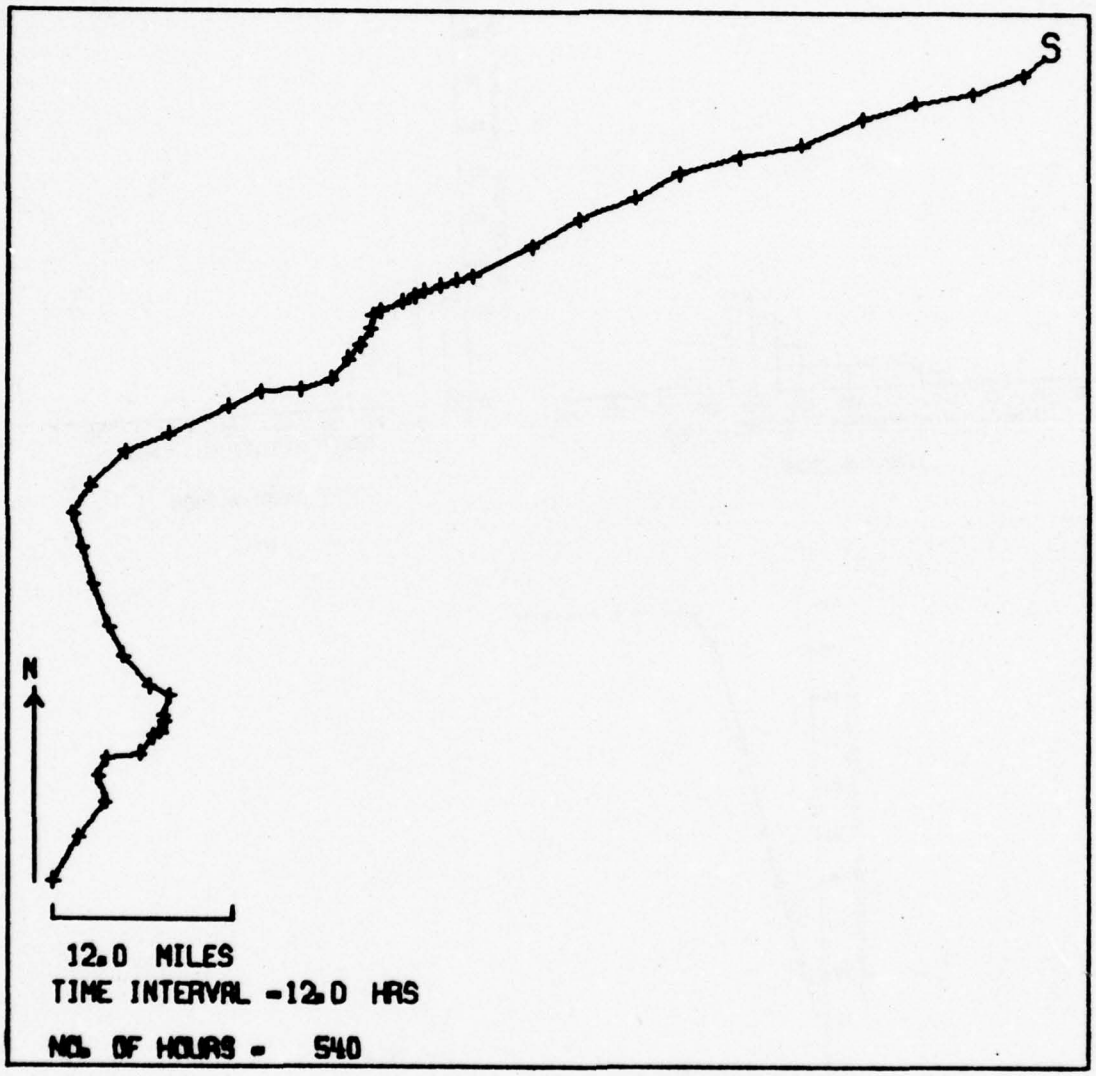

TOTAL NUMBER OBS. = 3282
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 8 290M

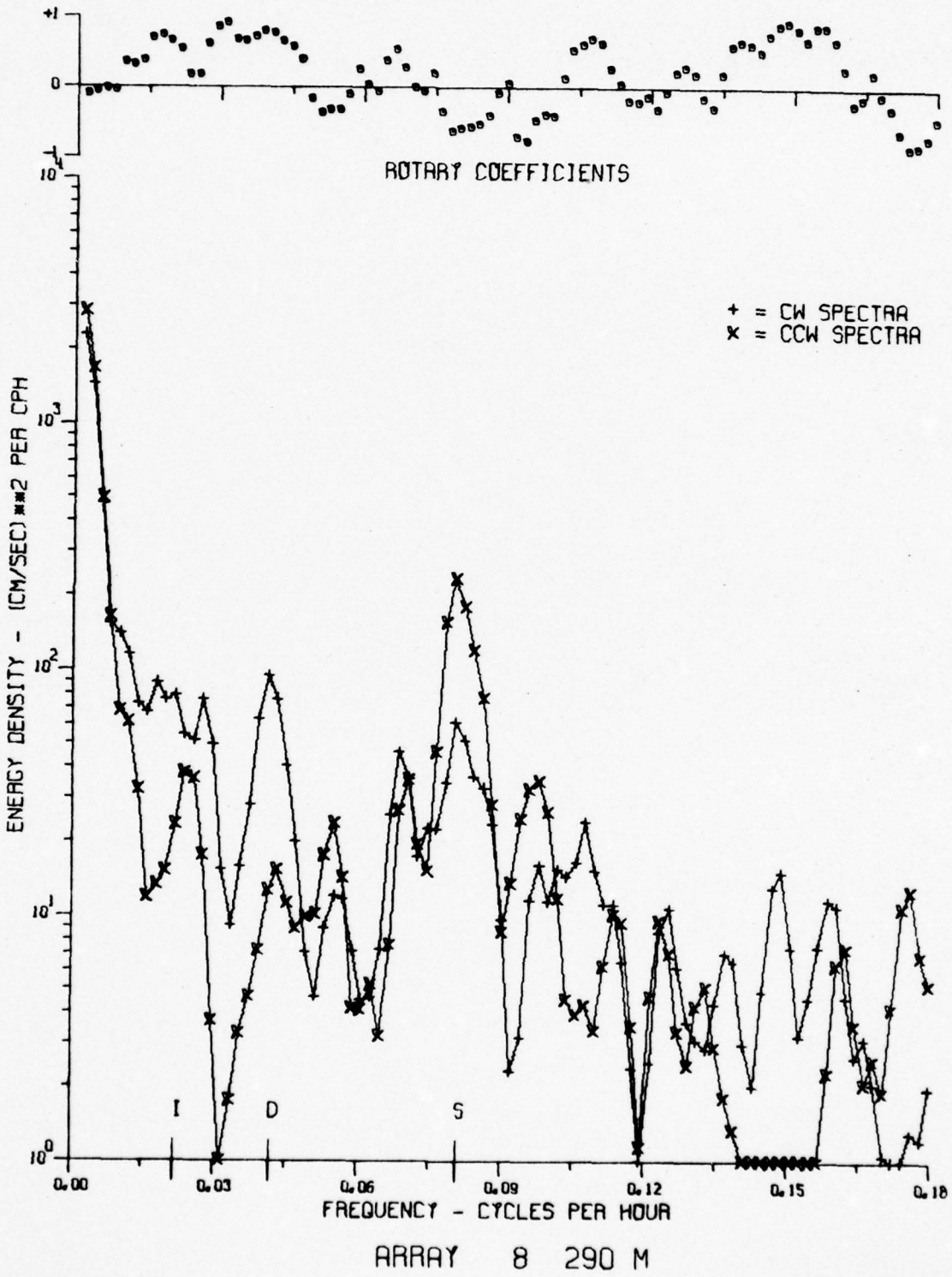
(b)


CUMULATIVE FREQUENCY
⊙ = 290 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 8

(c)

ARRAY 8 290 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 8 290 M

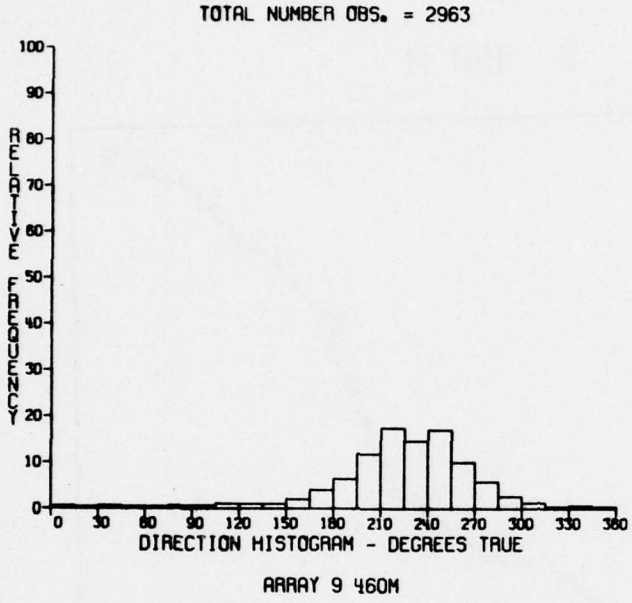
ARRAY 9

CARIB 6PS 16 36 00N 61 47 00W FILM 764 START TIME 0000Z 06/16/72 WATER DEPTH =1
C45M SAMPLE DEPTH= 46C SAMPLE RATE 10 MIN RECORD LENGTH = 522 HOURS

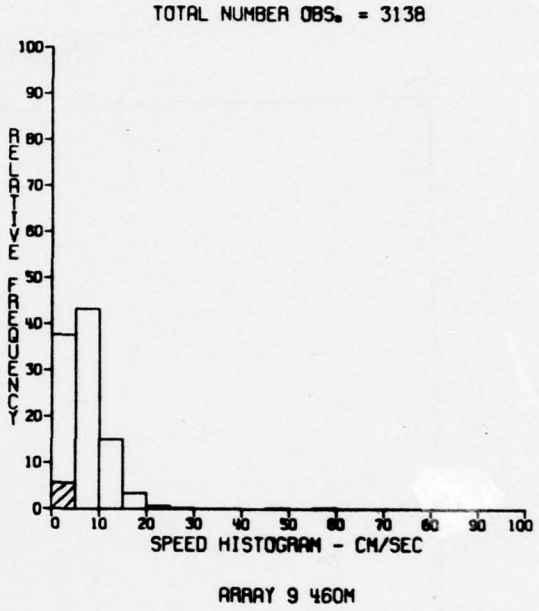
DIRECTION																						SUM	PER.CT.
0- 15	7			4	2	2	1															16	0.5
15- 30	11																					11	0.4
30- 45	15																					15	0.5
45- 60	10										3											13	0.4
60- 75	11																					11	0.4
75- 90	17																					17	0.5
90-105	18																					18	0.6
105-120	28																					28	0.9
120-135	21	5																				26	0.8
135-150	13	18																				31	1.0
150-165	26	25	6																			57	1.8
165-180	46	55	18																			119	3.8
180-195	54	117	19																			190	6.1
195-210	84	202	60	2																		348	11.1
210-225	138	262	102	15																		517	16.5
225-240	97	216	84	34	1																	432	13.8
240-255	129	226	117	24	6																	502	16.0
255-270	94	126	49	22	6																	297	9.5
270-285	85	61	17	7																		170	5.4
285-300	39	35																				74	2.4
300-315	29	5																				34	1.1
315-330	11																					11	0.4
330-345	12								1		2											15	0.5
345-360	11																					11	0.4

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	1006	1353	472	108	15	2	1	1	0	2	0	3	0	0	0	0	0	0	0	0	0	2963
PER.CT.	32.1	43.1	15.0	3.4	0.5	0.1	0.0	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

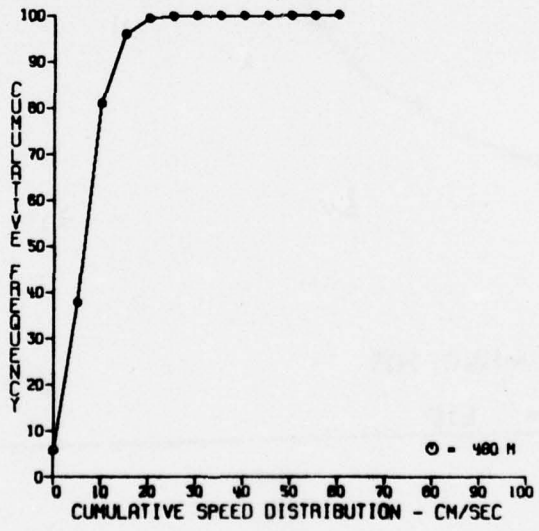
NUMBER OF ZERO SPEED AVERAGES = 175 PERCENTAGE ZERO SPEED AVERAGES = 5.6
TOTAL NUMBER OF OBS. = 3138


TOTAL NUMBER OBS. = 2963
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 9 460M

(a)

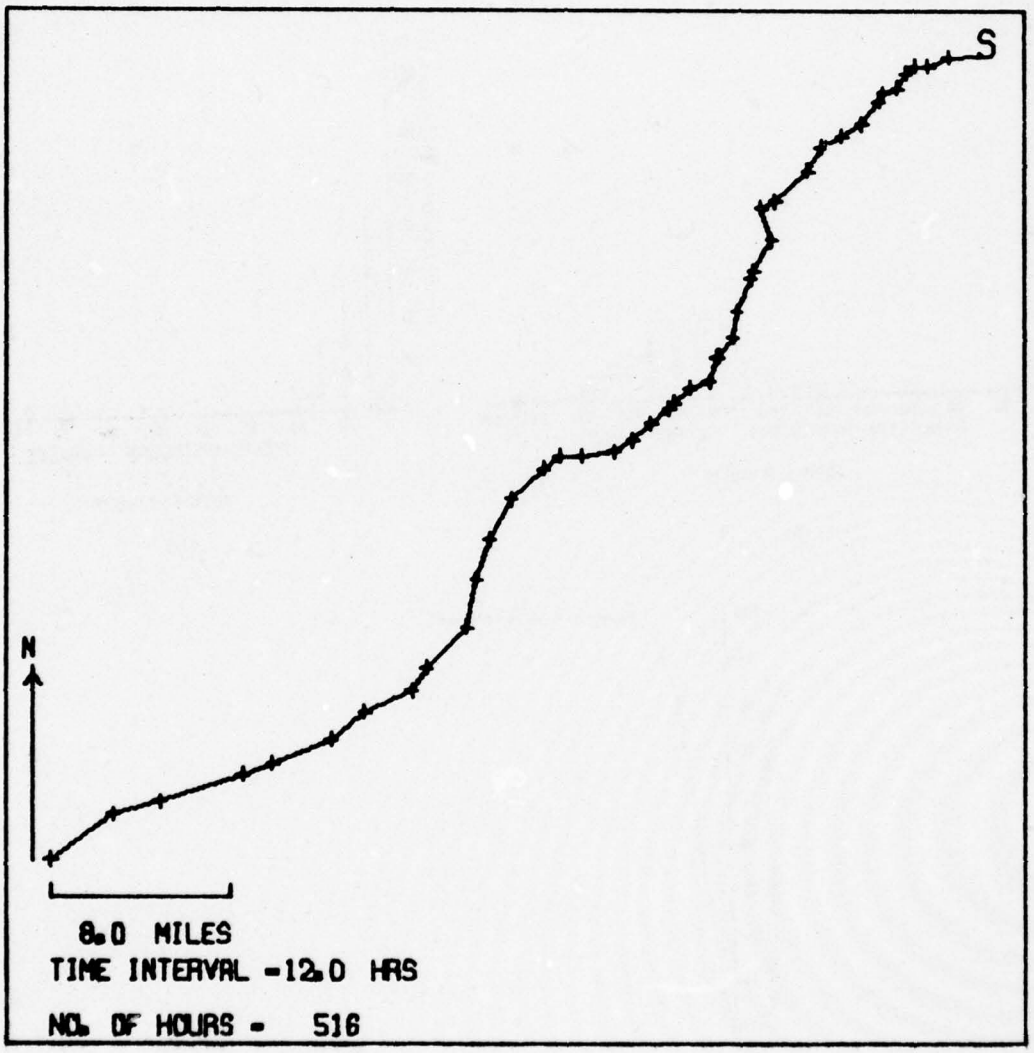

TOTAL NUMBER OBS. = 3138
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 9 460M

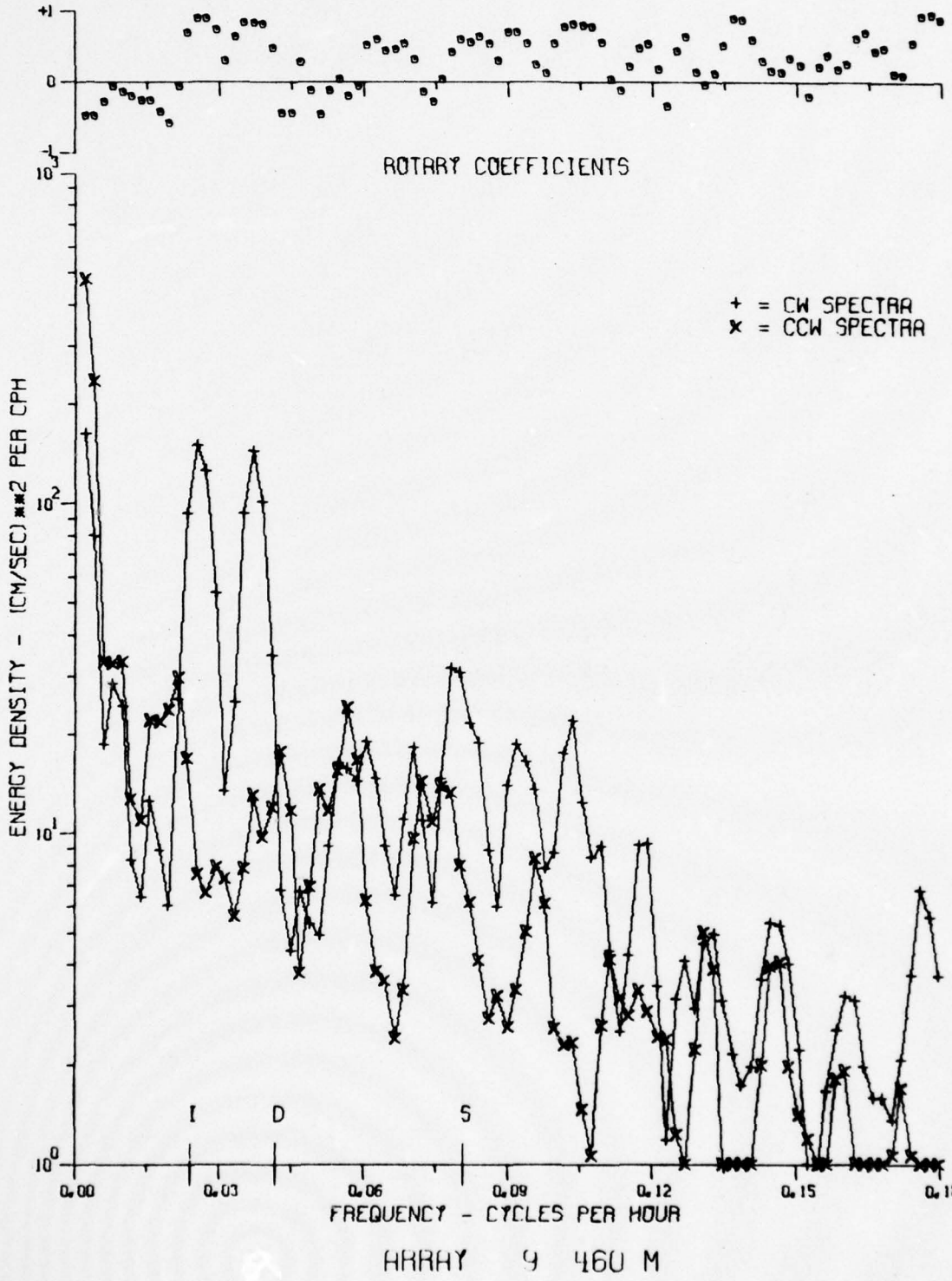
(b)


CUMULATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
⊙ = 460 M
0 10 20 30 40 50 60 70 80 90 100
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 9

(c)

ARRAY 9 460 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
× = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 9 460 M

ARRAY 10

CARIB 8RS 16 53 54N 62 02 48W FILM 762 START TIME 0600Z 06/16/72 WATER DEPTH =
760M SAMPLE DEPTH=260M SAMPLE RATE 10MIN RECORD LENGTH =436 HOURS

DIRECTION																					SUM	PER.CT.
0- 15	64	79	23																		166	6.3
15- 30	33	23	21	2																	79	3.0
30- 45	26	27	8																		61	2.3
45- 60	52	24																			76	2.9
60- 75	64	13	2																		79	3.0
75- 90	40	12																			52	2.0
90-105	48	35																			83	3.2
105-120	42	38	1																		81	3.1
120-135	37	29	3																		69	2.6
135-150	37	17	2																		56	2.1
150-165	38	6																			44	1.7
165-180	35	4	2																		41	1.6
180-195	23	11		1																	35	1.3
195-210	23	6		1																	30	1.1
210-225	20	11																			31	1.2
225-240	37	31																			68	2.6
240-255	48	40																			88	3.4
255-270	50	55	16																		121	4.6
270-285	32	66	15																		113	4.3
285-300	45	74	36																		155	5.9
300-315	51	87	47																		185	7.1
315-330	59	85	19																		163	6.2
330-345	61	68	17																		146	5.6
345-360	61	82	42	2																	187	7.1

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	1026	923	254	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2209
PER.CT.	39.1	35.2	9.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

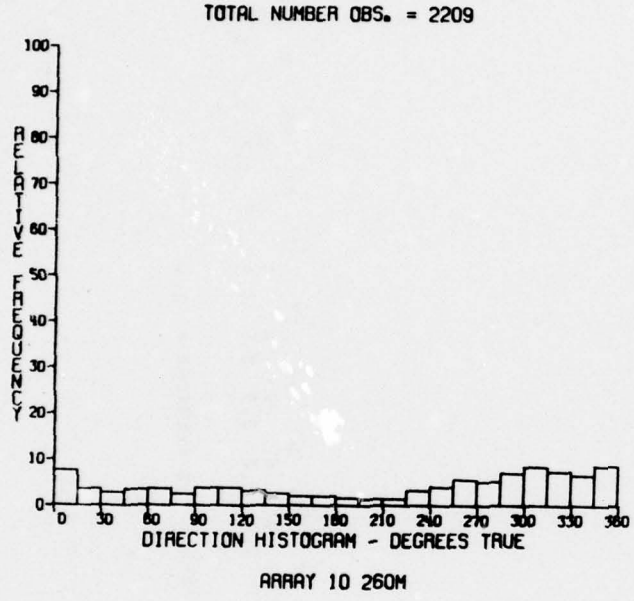
NUMBER OF ZERO SPEED AVERAGES = 413 PERCENTAGE ZERO SPEED AVERAGES = 15.8
TOTAL NUMBER OF OBS. = 2622

CARIB GPS 16 53 54N 62 02 48W FILM 755 START TIME 0600Z 06/16/72 WATER DEPTH = 760M SAMPLE DEPTH 874M SAMPLE RATE 10MIN RECORD LENGTH 518 HOURS

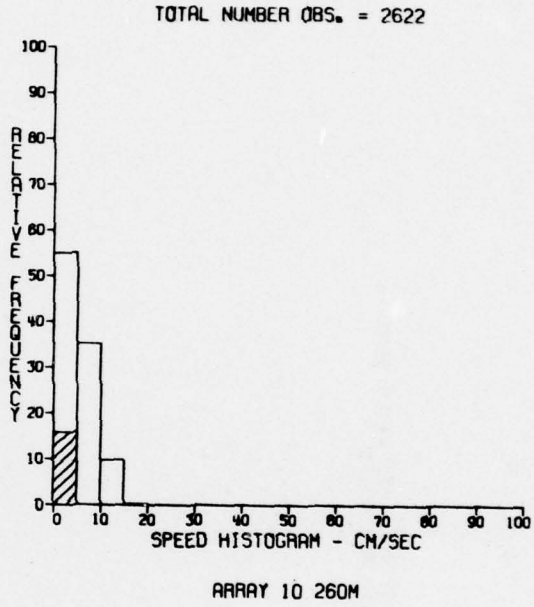
DIRECTION																						SUM	PER.CT.
0- 15	15	13	4																			32	1.0
15- 30	15	10																				25	0.8
30- 45	6	1																				7	0.2
45- 60	11	4																				15	0.5
60- 75	10	5																				15	0.5
75- 90	8	1																				9	0.3
90-105	10																					10	0.3
105-120	11	9																				20	0.6
120-135	11	11																				22	0.7
135-150	5	6	1																			12	0.4
150-165	9	16	1																			26	0.8
165-180	16	32	1																			49	1.6
180-195	25	60	7																			92	3.0
195-210	72	72	5																			149	4.8
210-225	81	103	5																			189	6.1
225-240	75	117	18																			210	6.8
240-255	70	109	15																			194	6.2
255-270	55	142	29																			226	7.3
270-285	99	192	52	1																		344	11.1
285-300	107	206	96	1																		410	13.2
300-315	83	142	85	18																		328	10.5
315-330	77	167	61	1																		306	9.8
330-345	78	121	52	5																		256	8.2
345-360	32	44	13																			89	2.9

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	981	1583	445	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3035
PER.CT.	31.5	50.9	14.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

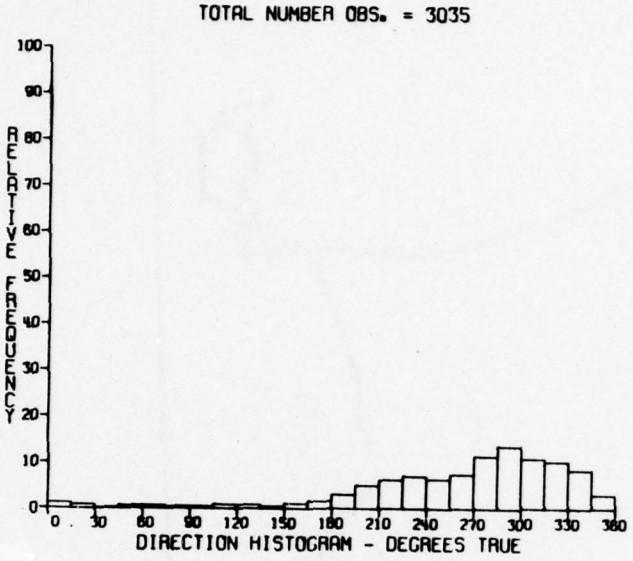
NUMBER OF ZERO SPEED AVERAGES = 75 PERCENTAGE ZERO SPEED AVERAGES = 2.4
TOTAL NUMBER OF OBS. = 3110


TOTAL NUMBER OBS. = 2209
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 10 260M

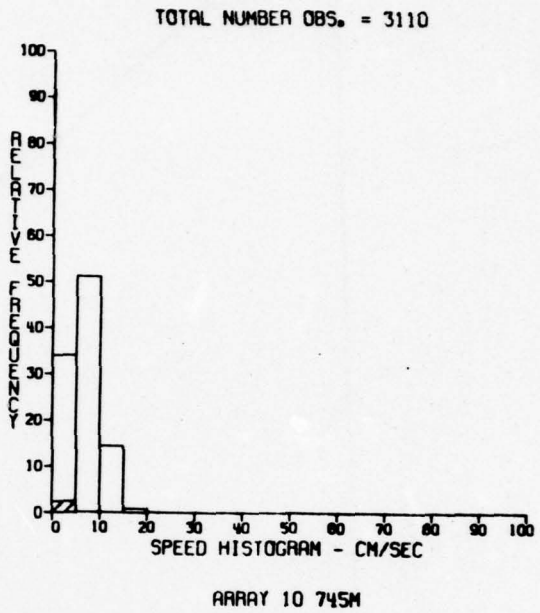
(a)


TOTAL NUMBER OBS. = 2622
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 10 260M

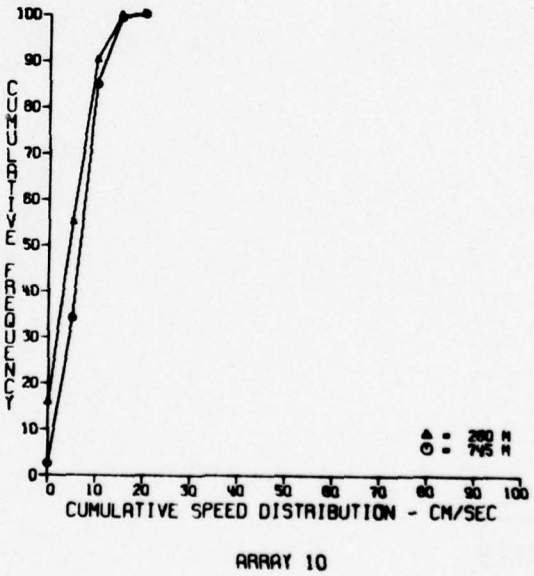
(b)


TOTAL NUMBER OBS. = 3035
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 10 745M

(a)

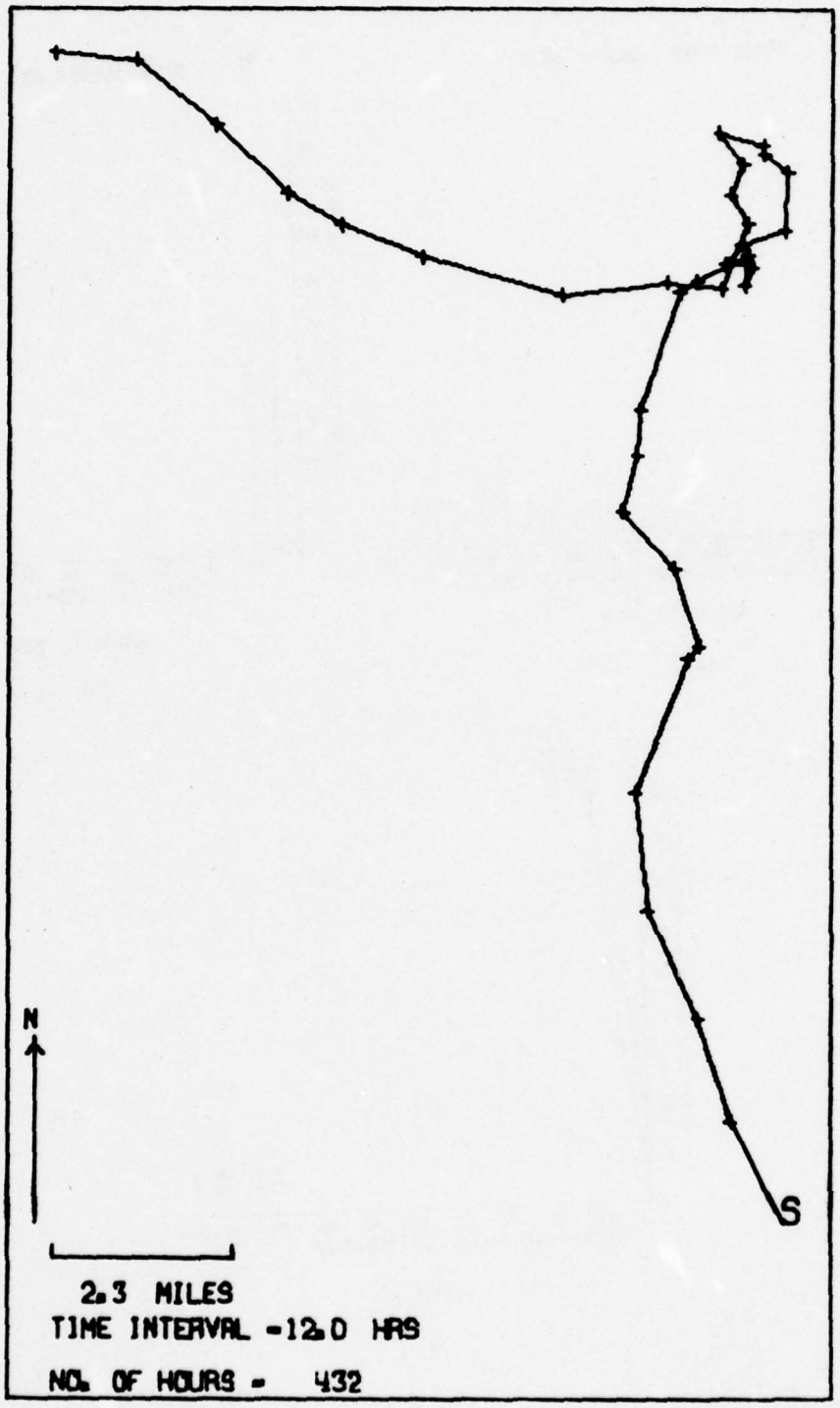

TOTAL NUMBER OBS. = 3110
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 10 745M

(b)

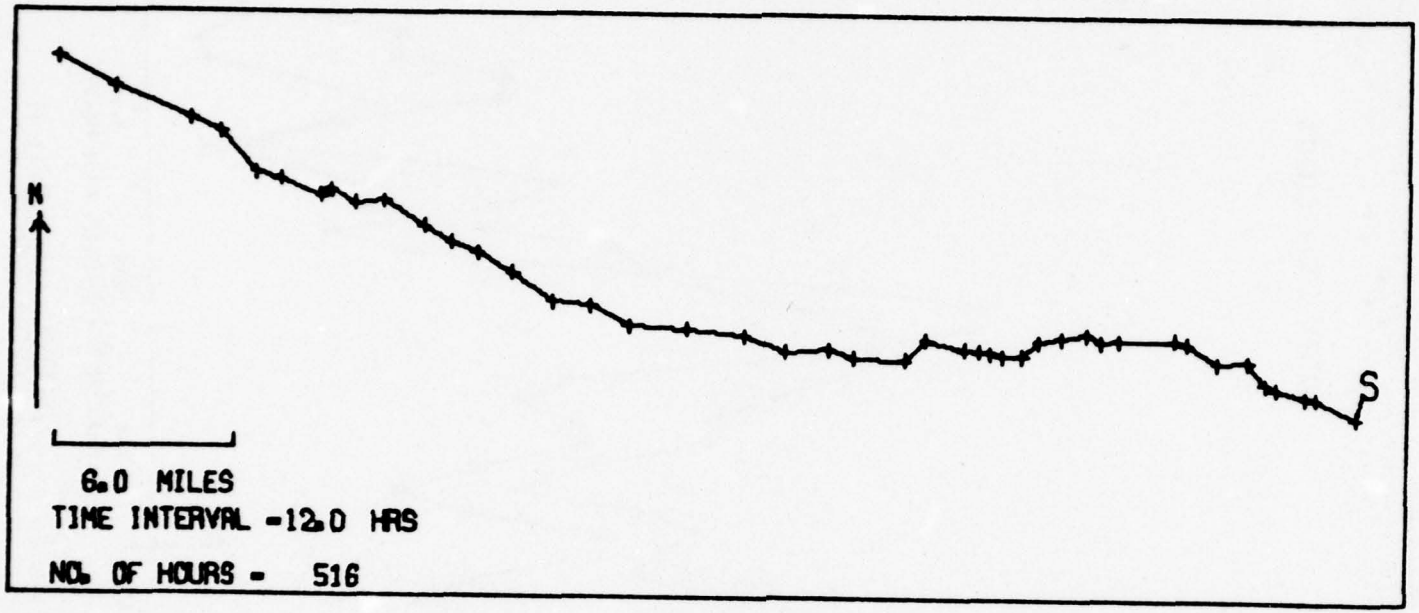

CUMULATIVE FREQUENCY
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 10

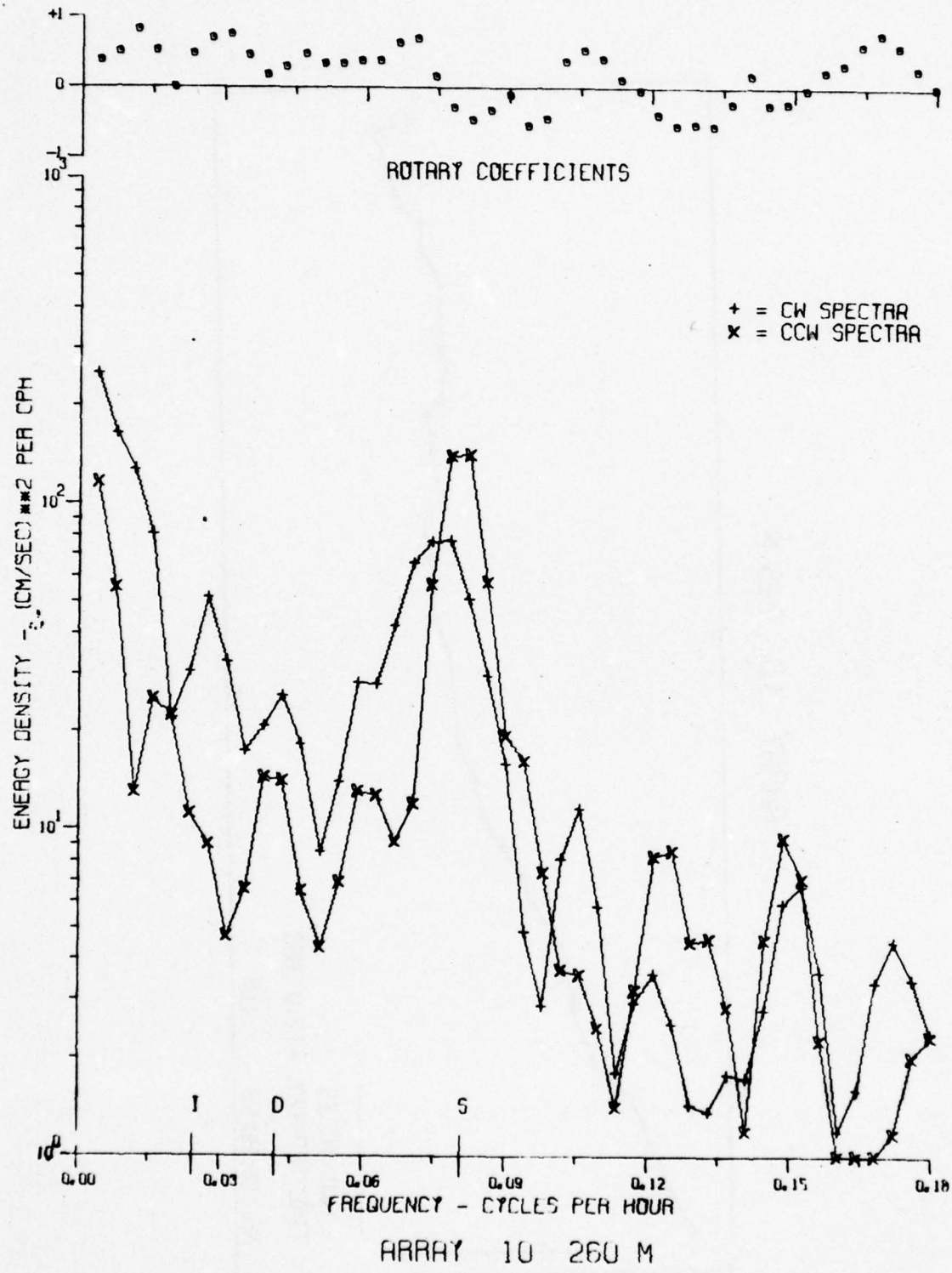
(c)

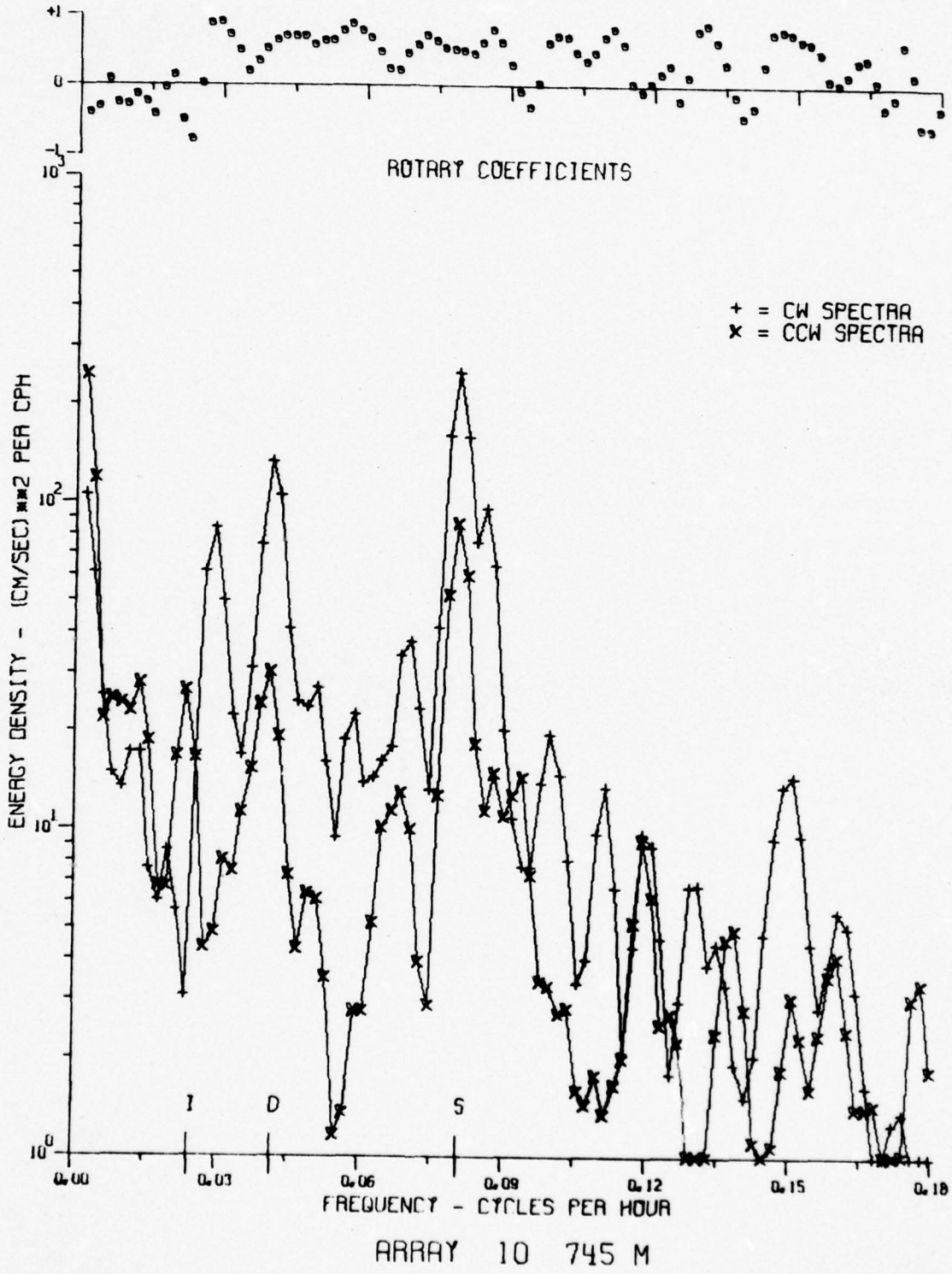
ARRAY 10 260 M



ARRAY 10 745 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
× = CCW SPECTRA
ENERGY DENSITY - (CM/SEC) **2 PER CPH
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 10 260 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
× = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 10 745 M

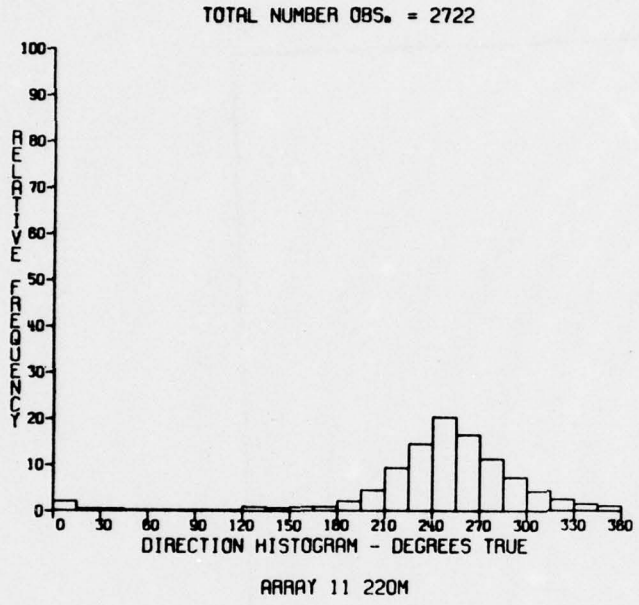
ARRAY 11

CARIB BPS 17 50 53N 65 47 37W FILM 570 START TIME 1500Z 03/28/67 WATER DEPTH = 1
975M SAMPLE DEPTH = 220M SAMPLE RATE 10MIN RECORD LENGTH = 453 HOURS

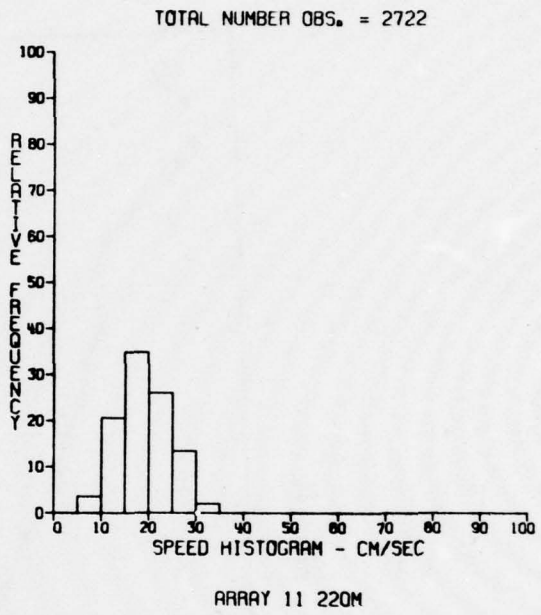
DIRECTION							SUM	PER.CT.
0- 15	1	18	32				51	1.9
15- 30		3	7				10	0.4
30- 45		1	5	1			7	0.3
45- 60		1	2	1			4	0.1
60- 75		3	2	1			6	0.2
75- 90		1	1	2			4	0.1
90-105		1	5				6	0.2
105-120		1	2	2			5	0.2
120-135		8	8	4	2		22	0.8
135-150		2	9	6			17	0.6
150-165		3	12	7			22	0.8
165-180		1	12	7	2		22	0.8
180-195		1	24	23	4	3	55	2.0
195-210		4	24	42	39	9 1	119	4.4
210-225		3	44	102	76	23	248	9.1
225-240		5	44	150	120	67 7	393	14.4
240-255		3	90	201	167	100 25	546	20.1
255-270		5	96	152	145	75 13	446	16.4
270-285		6	52	106	84	48 5	301	11.1
285-300		6	49	76	41	25	197	7.2
300-315		5	37	42	17	10	111	4.1
315-330		7	32	14	10	2	65	2.4
330-345		4	30	3	1		38	1.4
345-360		4	21	2			27	1.0

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	1	96	360	944	708	362	51	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2722
PER.CT.	0.0	3.5	20.6	34.7	26.0	13.3	1.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

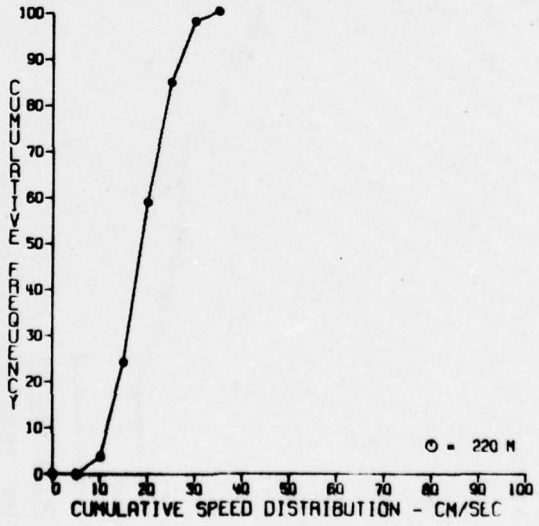
NUMBER OF ZERO SPEED AVERAGES = 0 PERCENTAGE ZERO SPEED AVERAGES = 0.0
TOTAL NUMBER OF OBS. = 2722


TOTAL NUMBER OBS. = 2722
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 11 220M

(a)

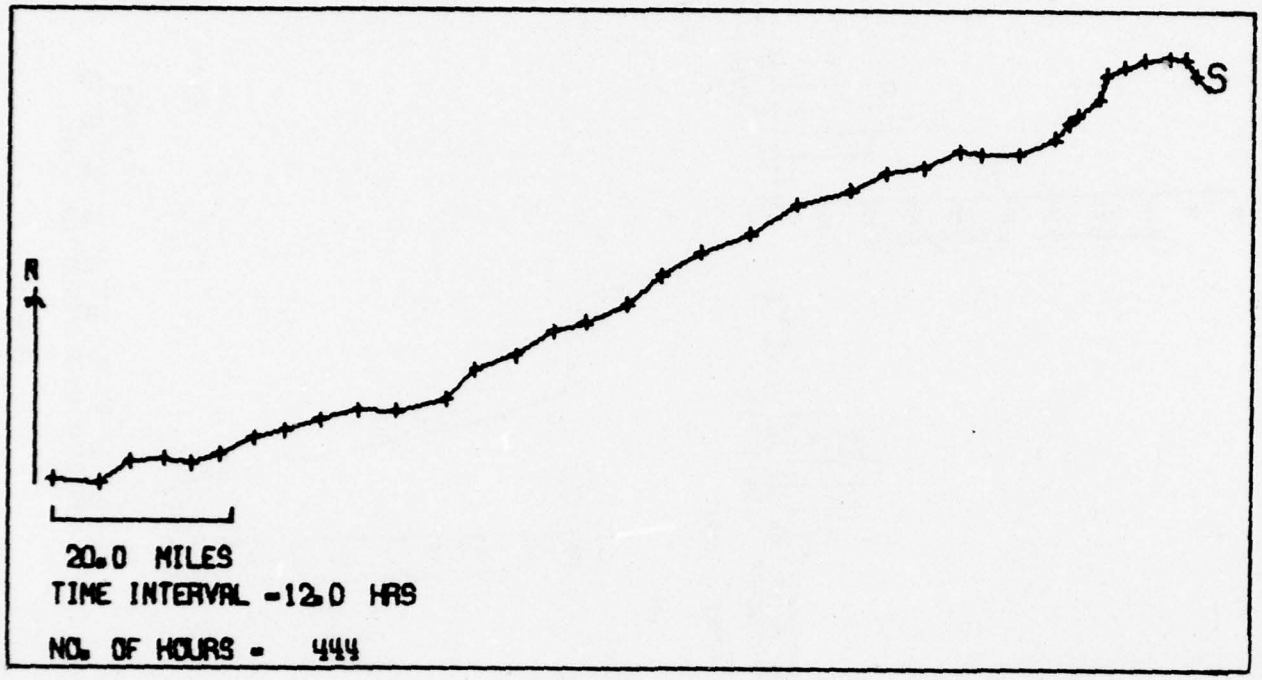

TOTAL NUMBER OBS. = 2722
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 11 220M

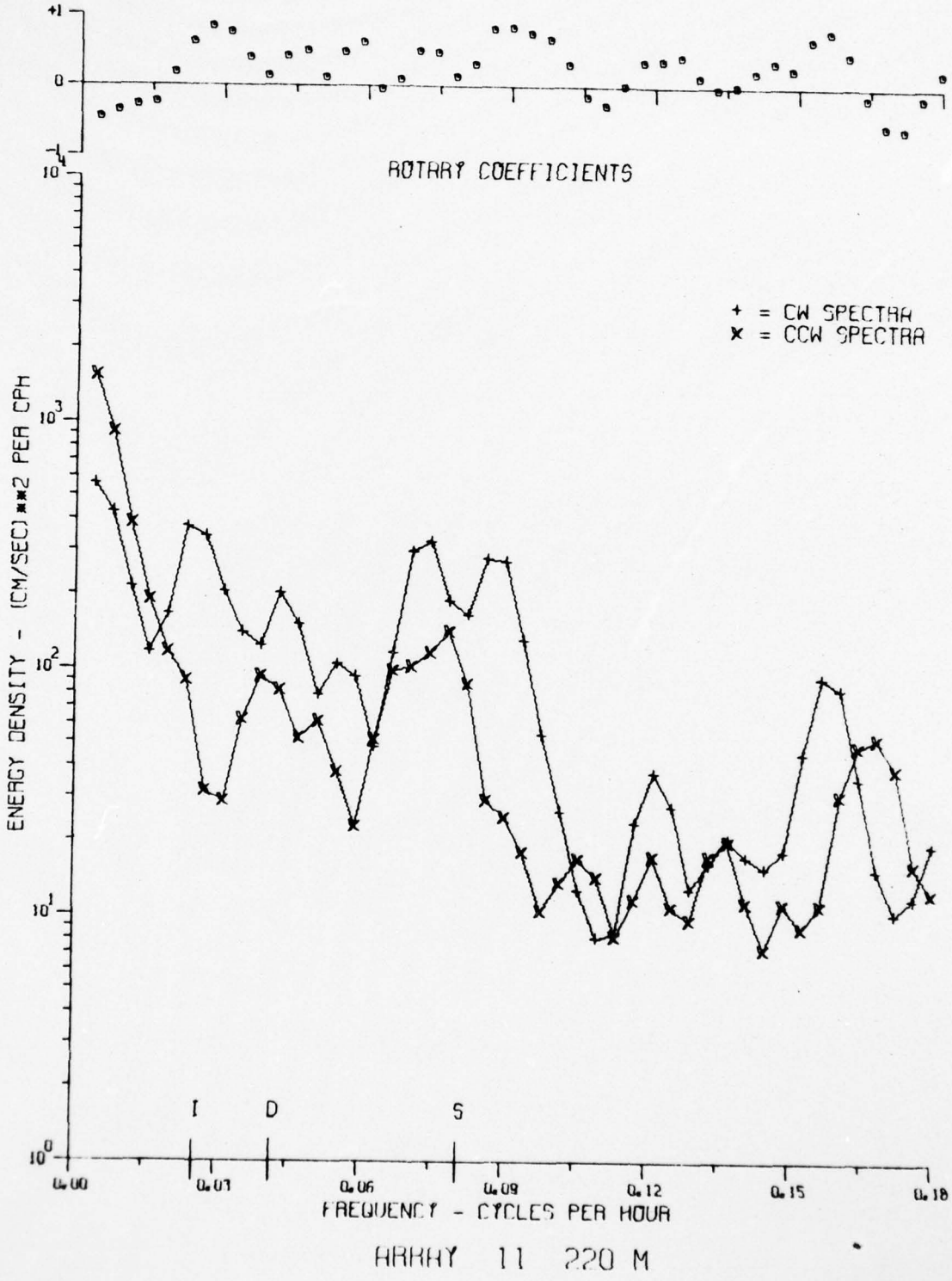
(b)


CUMULATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
⊙ = 220 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 11

(c)

ARRAY 11 220 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 11 220 M

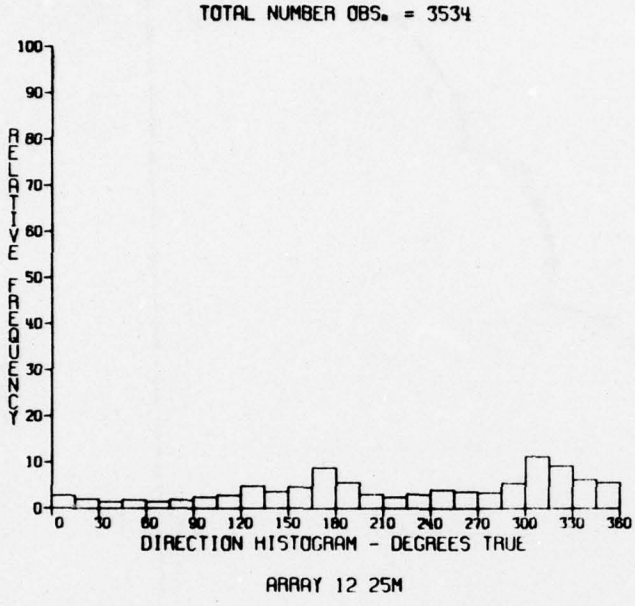
ARRAY 12

CARIB 8PS 17 39 14N 64 55 11W FILM 855 START TIME 1400Z 10/25/72 WATER DEPTH =
30M SAMPLE DEPTH= 25M SAMPLE RATE 15 MIN RECORD LENGTH = 890 HOURS

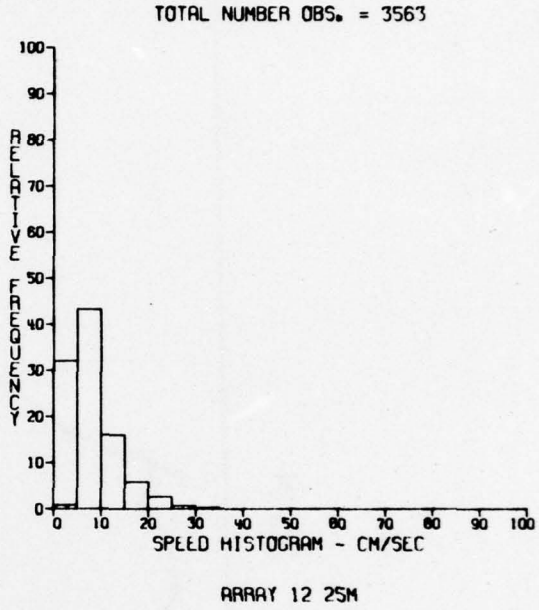
DIRECTION								SUM	PER.CT.
0- 15	47	46	2					95	2.7
15- 30	51	21						72	2.0
30- 45	38	11						49	1.4
45- 60	47	17						64	1.8
60- 75	37	10						47	1.3
75- 90	45	19						64	1.8
90-105	39	41	1					81	2.3
105-120	48	48	4					100	2.8
120-135	39	100	22	2	2			165	4.6
135-150	31	70	22	4				127	3.6
150-165	34	67	42	6	6	3	1	159	4.5
165-180	32	119	88	45	18	5		307	8.6
180-195	36	68	54	16	5			199	5.6
195-210	41	50	12	2				105	2.9
210-225	40	40	6					86	2.4
225-240	51	44	12					107	3.0
240-255	57	70	13					140	3.9
255-270	52	60	9	1				122	3.4
270-285	64	52	4	1				121	3.4
285-300	56	99	32	3	1			191	5.4
300-315	66	174	98	42	13	4		397	11.1
315-330	53	112	68	54	29	6	3	325	9.1
330-345	29	90	53	24	15	4	2	217	6.1
345-360	55	108	28	3				194	5.4

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	1108	1536	570	203	89	22	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3534
PER.CT.	31.1	43.1	16.0	5.7	2.5	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

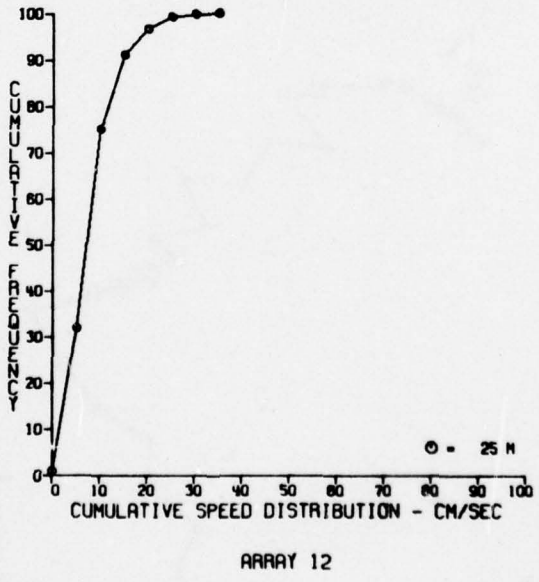
NUMBER OF ZERO SPEED AVERAGES = 29 PERCENTAGE ZERO SPEED AVERAGES = 0.8
TOTAL NUMBER OF OBS. = 3563


TOTAL NUMBER OBS. = 3534
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 12 25M

(a)

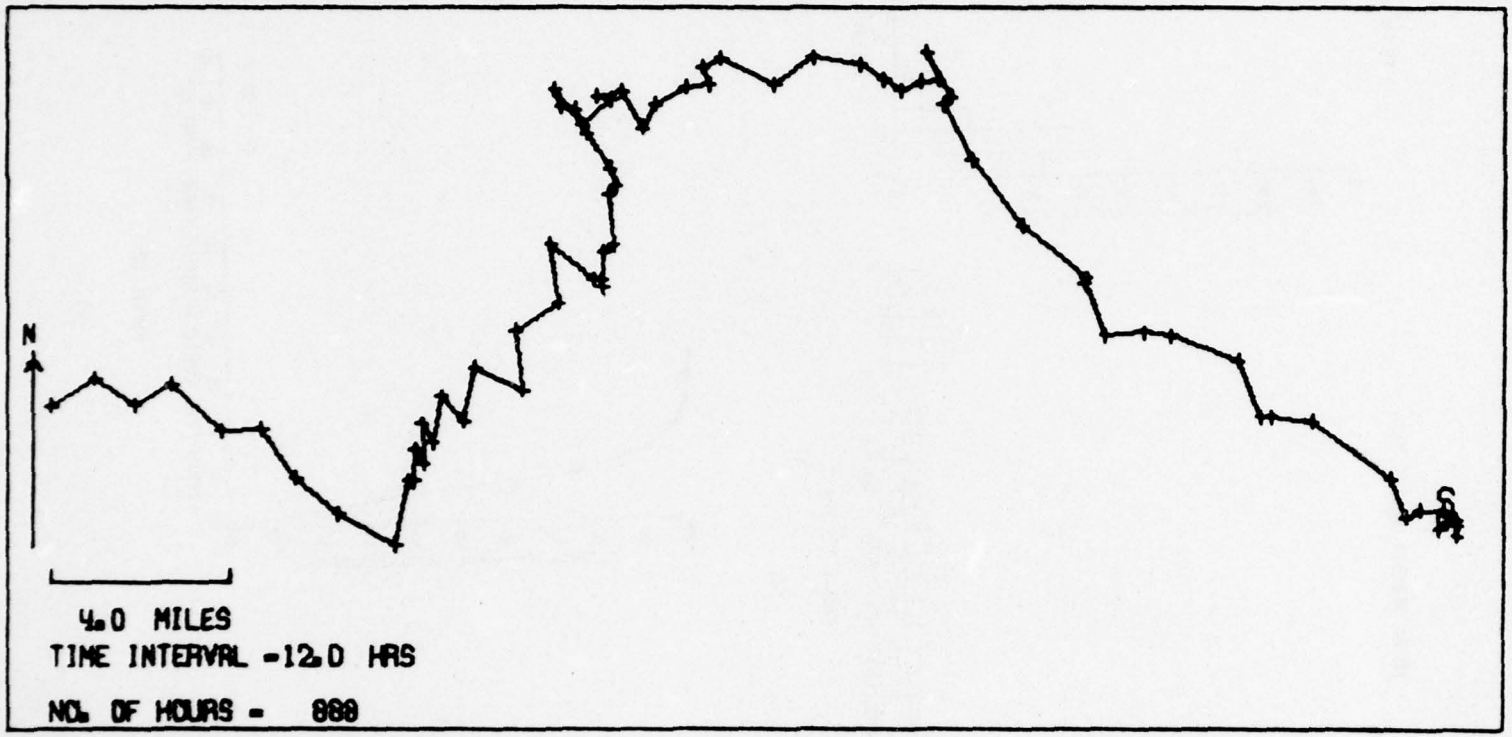

TOTAL NUMBER OBS. = 3563
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 12 25M

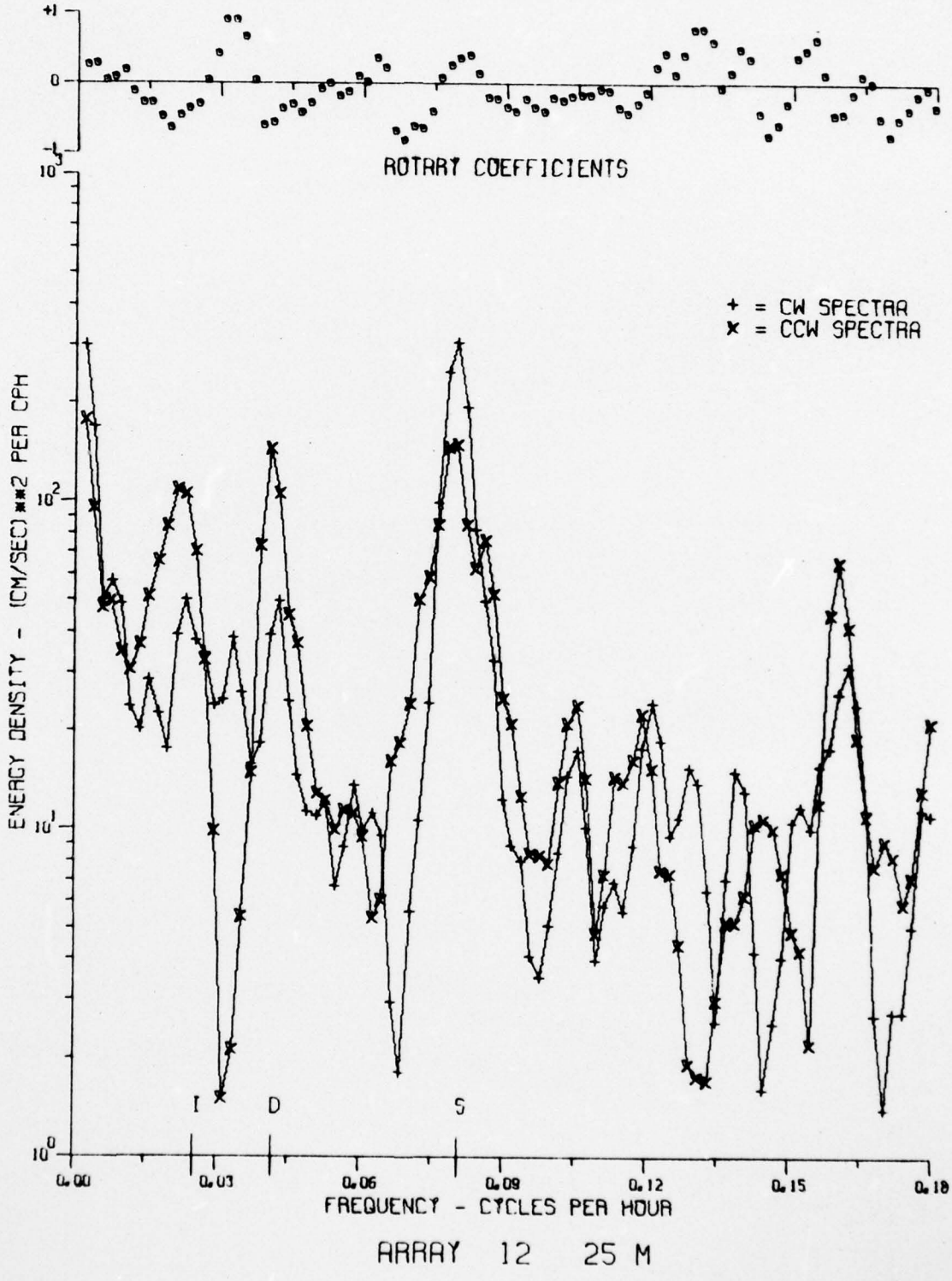
(b)


CUMULATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
⊙ = 25 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 12

(c)

ARRAY 12 25 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
× = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 12 25 M

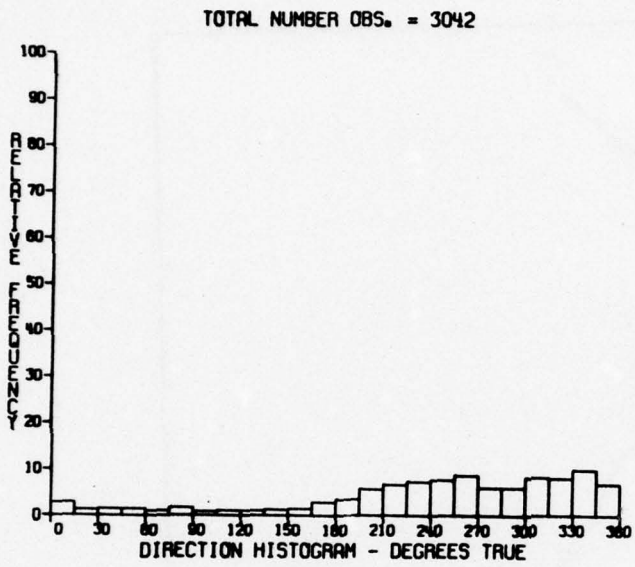
ARRAY 13

CARIB 6PS 17 44 54N 63 03 48W FILM 760 START TIME 1700 06/16/72 WATER DEPTH =
735M SAMPLE DEPTH= 245M SAMPLE RATE 10MIN RECORD LENGTH = 523 HOURS

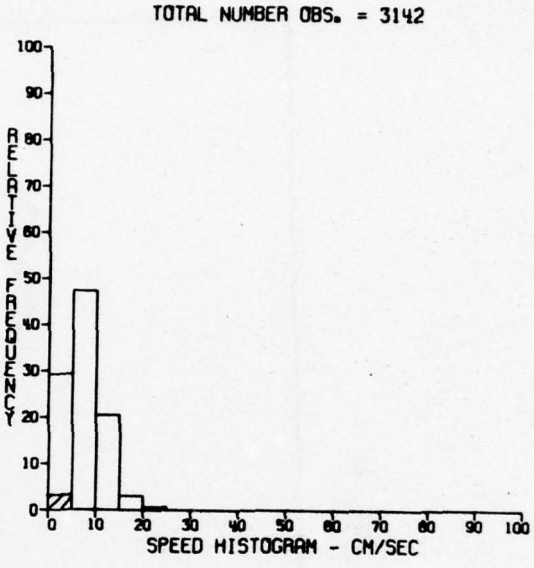
DIRECTION						SUM	PER.CT.
0- 15	38	34	8	2		82	2.6
15- 30	14	23				37	1.2
30- 45	23	20	1			44	1.4
45- 60	27	10	1	1		39	1.2
60- 75	13	8	6			27	0.9
75- 90	26	12	5	1	1	45	1.4
90-105	15	4	1			20	0.6
105-120	20	7	2			29	0.9
120-135	18	7	1			26	0.8
135-150	25	7				32	1.0
150-165	30	11	3			44	1.4
165-180	26	43	12	1		82	2.6
180-195	26	56	20			102	3.2
195-210	33	102	35	1		171	5.4
210-225	42	119	39			200	6.4
225-240	45	126	44	2		217	6.9
240-255	32	169	29	2		232	7.4
255-270	44	142	70	4	2	262	8.3
270-285	42	109	33			184	5.9
285-300	48	99	34	1		182	5.8
300-315	42	119	81	3	1	246	7.8
315-330	46	108	74	11	1	240	7.6
330-345	75	95	87	27	10	294	9.4
345-360	64	53	53	34	1	205	6.5

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	814	1483	639	90	16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3042
PER.CT.	25.9	47.2	20.3	2.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

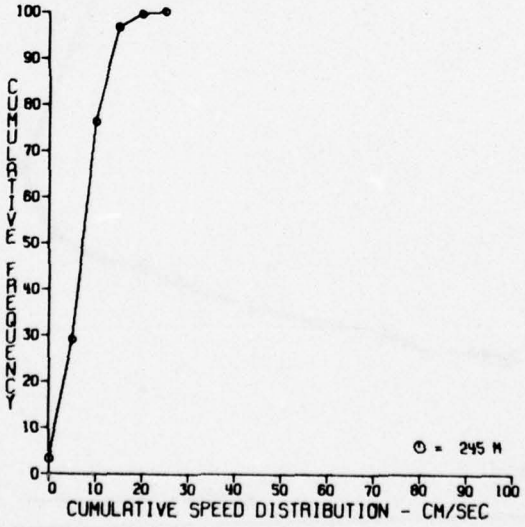
NUMBER OF ZERO SPEED AVERAGES = 100 PERCENTAGE ZERO SPEED AVERAGES = 3.2
TOTAL NUMBER OF OBS. = 3142


TOTAL NUMBER OBS. = 3042
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 13 245M

(a)

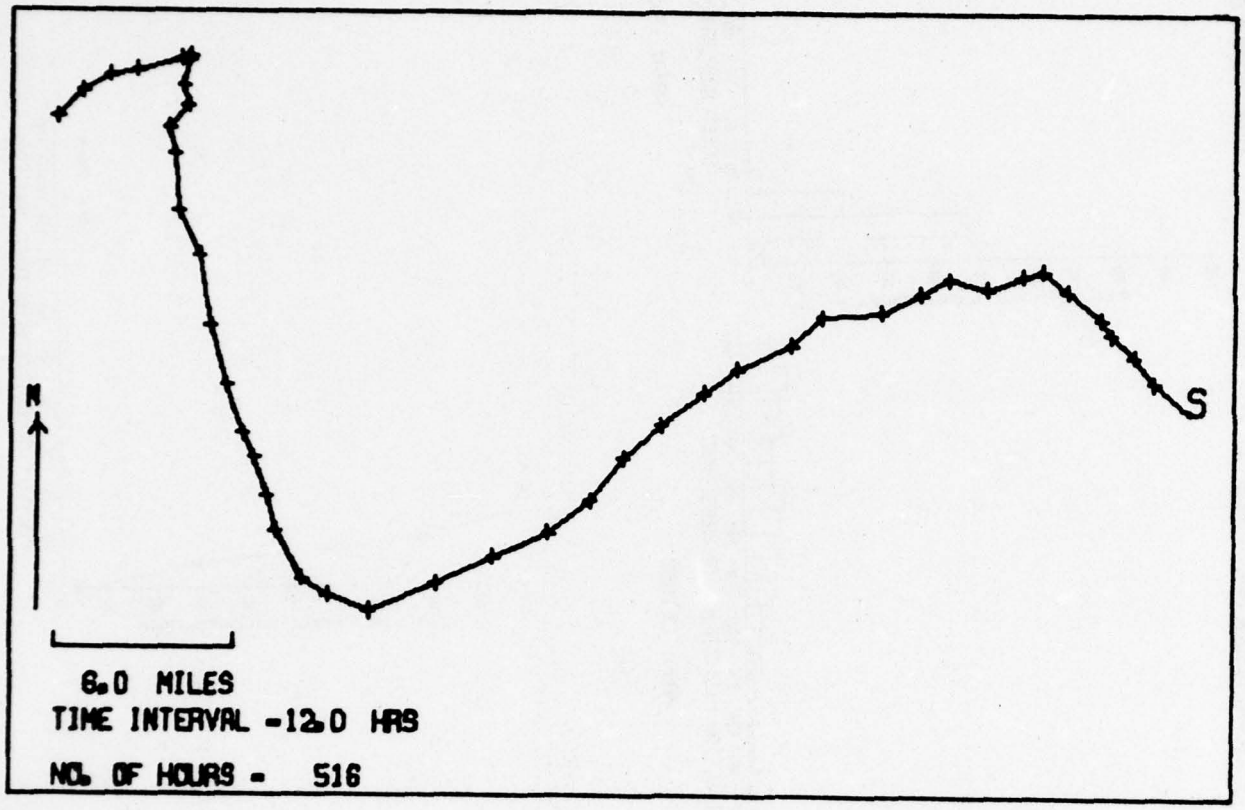

TOTAL NUMBER OBS. = 3142
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 13 245M

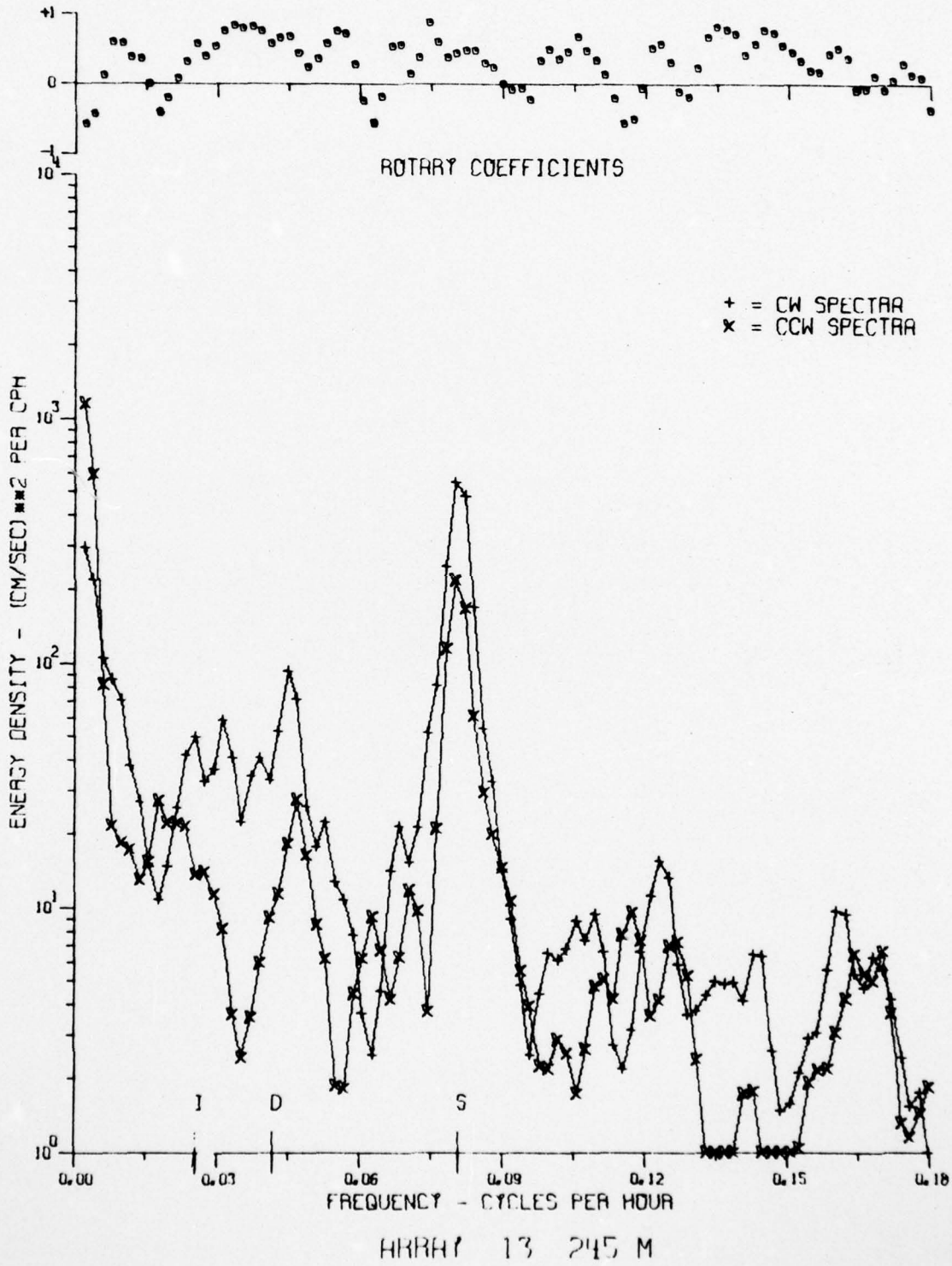
(b)


CUMULATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
⊙ = 245 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 13

(c)

ARRAY 13 245 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 13 245 M

ARRAY 14

CARIB 6PS 17 52 53N 65 54 38W FILM 566 START TIME 1800 03/30/67 WATER DEPTH =1
515M SAMPLE DEPTH= 10CM SAMPLE RATE 10MIN RECORD LENGTH = 360 HOURS

DIRECTION								SUM	PER.CT.
0- 15	22	74	12					108	5.0
15- 30	18	28	7					53	2.5
30- 45	6	19	10		1			36	1.7
45- 60	14	21	3					38	1.8
60- 75	15	8	2	1				26	1.2
75- 90	21	12	3	5				41	1.9
90-105	15	12	7					34	1.6
105-120	23	6	3					32	1.5
120-135	20	20	5	1				46	2.1
135-150	16	27	7	3				53	2.5
150-165	18	27	16	1				62	2.9
165-180	16	36	20	2				74	3.4
180-195	15	47	24	3				89	4.1
195-210	18	47	42	19		5		131	6.1
210-225	25	65	44	13	4	3		154	7.1
225-240	29	58	47	33	8	2		177	8.2
240-255	30	37	62	33	9	2		173	8.0
255-270	24	50	67	28	14	5	1	189	8.7
270-285	41	96	90	19	3			209	9.7
285-300	13	61	23	3			1	101	4.7
300-315	24	42	43	2				111	5.1
315-330	19	31	8					58	2.7
330-345	20	49	17	1			1	88	4.1
345-360	9	27	13	1	2			52	2.4

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	471	900	535	168	41	17	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2135
PER.CT.	21.8	41.6	24.7	7.8	1.9	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

NUMBER OF ZERO SPEED AVERAGES = 27 PERCENTAGE ZERO SPEED AVERAGES = 1.2
TOTAL NUMBER OF OBS. = 2162

CARIB 6RS 17 52 53N 65 54 38W FILM 569 START TIME 1800 03/30/67 WATER DEPTH =1
615M SAMPLE DEPTH= 105M SAMPLE RATE 10MIN RECORD LENGTH = 354 HOURS

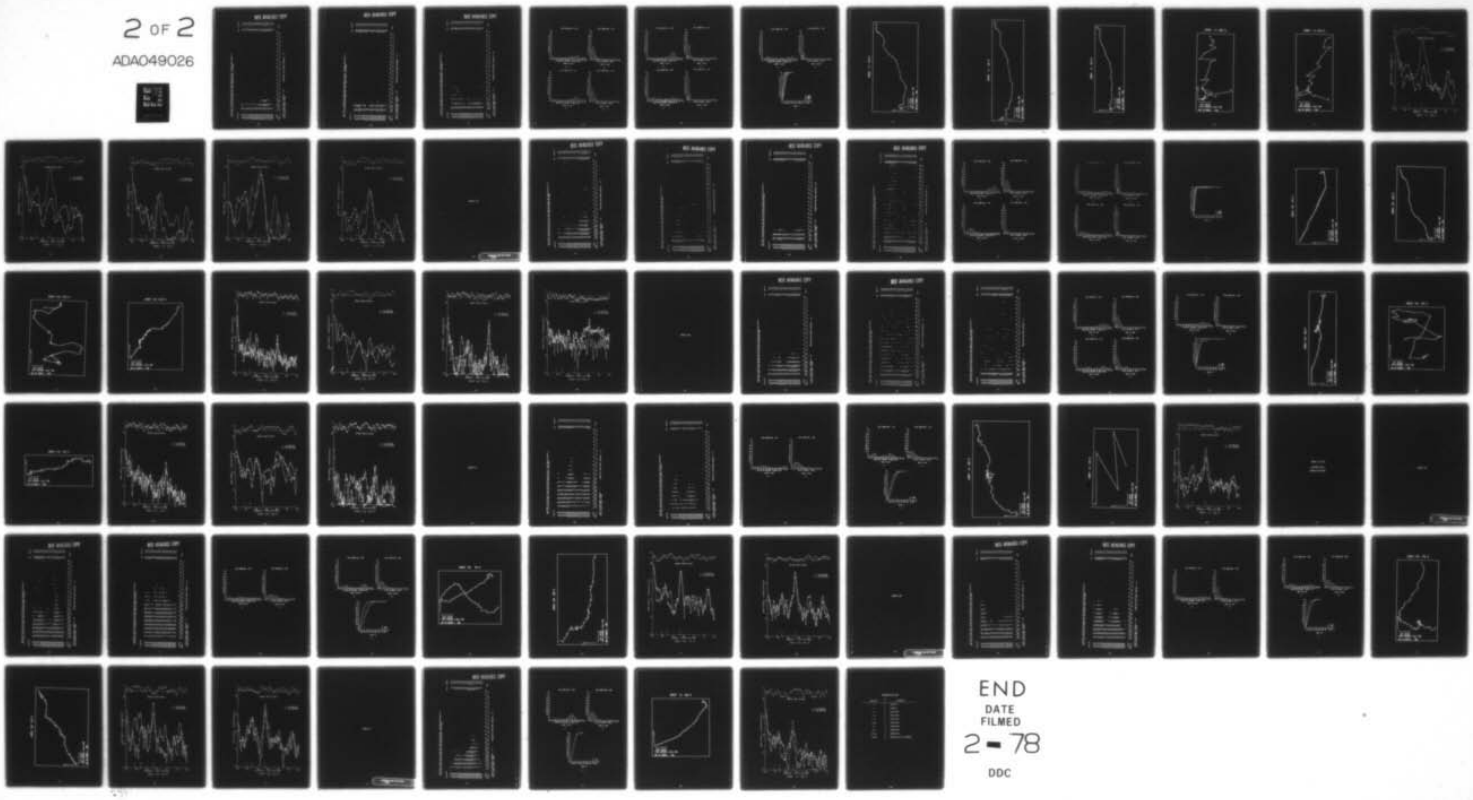
DIRECTION																						SUM	PER.CT.
0- 15	28	80	16	1																		125	5.9
15- 30	16	28	9	2	1																	56	2.6
30- 45	17	31	12	2																		62	2.9
45- 60	17	19	4	2		1																43	2.0
60- 75	16	11	2	6	1																	36	1.7
75- 90	11	15	7	6																		39	1.8
90-105	13	11	1	2																		27	1.3
105-120	5	15	2	2																		24	1.1
120-135	10	13	5																			28	1.3
135-150	10	10	2																			22	1.0
150-165	17	15	3	1																		36	1.7
165-180	19	24	16	1																		60	2.8
180-195	9	34	27		1																	71	3.3
195-210	24	46	36	4	1																	111	5.2
210-225	19	27	34	19	2																	101	4.7
225-240	14	38	31	30	12	4																129	6.0
240-255	23	36	63	31	19	1																173	8.1
255-270	33	74	107	58	28	3																303	14.2
270-285	27	75	71	21	7	1																202	9.5
285-300	19	57	16	3																		95	4.5
300-315	18	51	30	10		1																110	5.2
315-330	22	46	25	4																		97	4.5
330-345	21	40	20	5	1																	87	4.1
345-360	20	37	16	2																		75	3.5

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	426	833	555	212	73	11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2112
PER.CT.	20.1	39.1	26.0	9.9	3.4	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

NUMBER OF ZERO SPEED AVERAGES = 21 PERCENTAGE ZERO SPEED AVERAGES = 1.0
TOTAL NUMBER OF OBS. = 2133

AD-A049 026 NAVAL OCEANOGRAPHIC OFFICE WASHINGTON D C F/G 8/3
CURRENT METER DATA REPORT FOR THE EASTERN PART OF THE CARIBBEAN--ETC(U)
AUG 75 D A BURNS, M CAR
UNCLASSIFIED NOO-TN-6110-6-75 NL

2 OF 2
ADA049026



END
DATE FILMED
2-78
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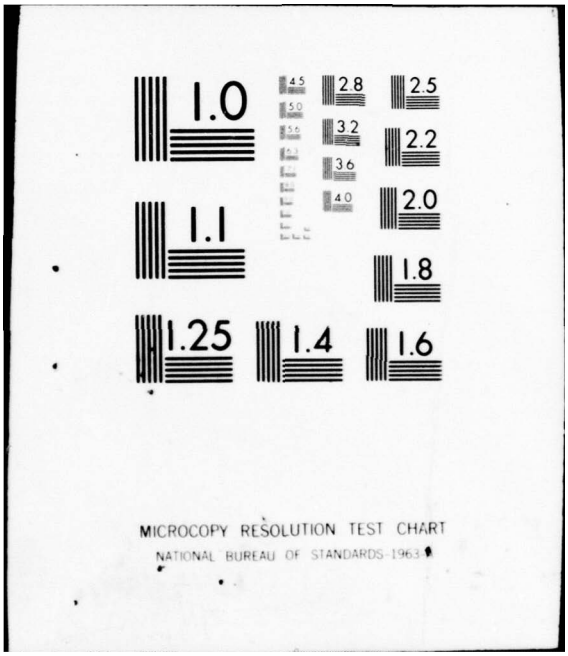

1.0
1.1
1.25
1.4
1.6
1.8
2.0
2.2
2.5
2.8
3.2
3.6
4.0
4.5
5.0
5.6
MICROCOPY RESOLUTION TEST CHART
NATIONAL BUREAU OF STANDARDS-1963

CARIB 8RS 17 52 53N 65 54 38W FILM 571 START TIME 1800 03/30/67 WATER DEPTH =1
615M SAMPLE DEPTH= 81CM SAMPLE RATE 10MIN RECORD LENGTH = 356 HOURS

DIRECTION										SUM	PER.CT.
0- 15	38	13								51	2.4
15- 30	17	1								18	0.8
30- 45	9									9	0.4
45- 60	18	1								19	0.9
60- 75	21	2								23	1.1
75- 90	17	1								18	0.8
90-105	18	1								19	0.9
105-120	17	1								18	0.8
120-135	17	9								26	1.2
135-150	21	5								26	1.2
150-165	18	7								25	1.2
165-180	29	3								32	1.5
180-195	49	4								53	2.5
195-210	59	22								81	3.8
210-225	48	67	3							118	5.5
225-240	34	52	4							90	4.2
240-255	40	171	63							274	12.8
255-270	85	289	83		1		1			459	21.4
270-285	129	155	34							318	14.8
285-300	61	68	4							133	6.2
300-315	56	44	5							105	4.9
315-330	34	6								40	1.9
330-345	21	2								23	1.1
345-360	17									17	0.8

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	873	924	196	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1995
PER.CT.	40.8	43.1	9.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

NUMBER OF ZERO SPEED AVERAGES = 147 PERCENTAGE ZERO SPEED AVERAGES = 6.9
TOTAL NUMBER OF OBS. = 2142

CARIB BPS 17 52 53N 65 54 38W FILM 567 START TIME 1800 03/30/67 WATER DEPTH =1
615M SAMPLE DEPTH= 1905 SAMPLE RATE 5MIN RECORD LENGTH = 354 HOURS

DIRECTION																				SUM	PER.CT.
0- 15	204	34																		238	5.6
15- 30	111	29																		140	3.3
30- 45	95	18																		113	2.7
45- 60	215	104																		319	7.5
60- 75	152	130																		282	6.6
75- 90	148	4																		152	3.6
90-105	87	1																		88	2.1
105-120	191	13																		204	4.8
120-135	174	32																		206	4.9
135-150	88																			88	2.1
150-165	35																			35	0.8
165-180	53	1																		54	1.3
180-195	205	38																		243	5.7
195-210	123	31																		154	3.6
210-225	57	10																		67	1.6
225-240	53	7																		60	1.4
240-255	161	49																		210	4.9
255-270	222	75	1																	298	7.0
270-285	114	40																		154	3.6
285-300	137	49																		186	4.4
300-315	146	129																		275	6.5
315-330	109	20																		129	3.0
330-345	31	2																		33	0.8
345-360	81	15																		96	2.3

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	2892	831	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3824
PER.CT.	75.5	19.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

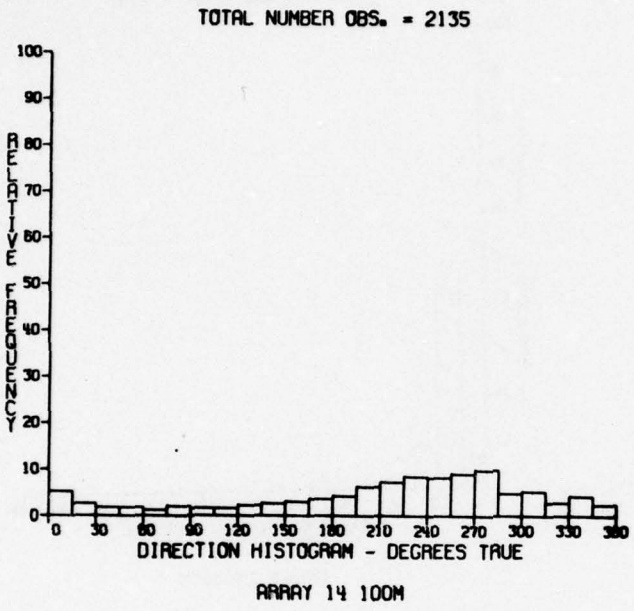
NUMBER OF ZERO SPEED AVERAGES = 422 PERCENTAGE ZERO SPEED AVERAGES = 9.9
TOTAL NUMBER OF OBS. = 4246

CARIB GPS 17 52 53N 65 54 38W FILM 568 START TIME 1800 03/30/67 WATER DEPTH =1
615M SAMPLE DEPTH=191CM SAMPLE RATE 10MIN RECORD LENGTH = 297 HOURS

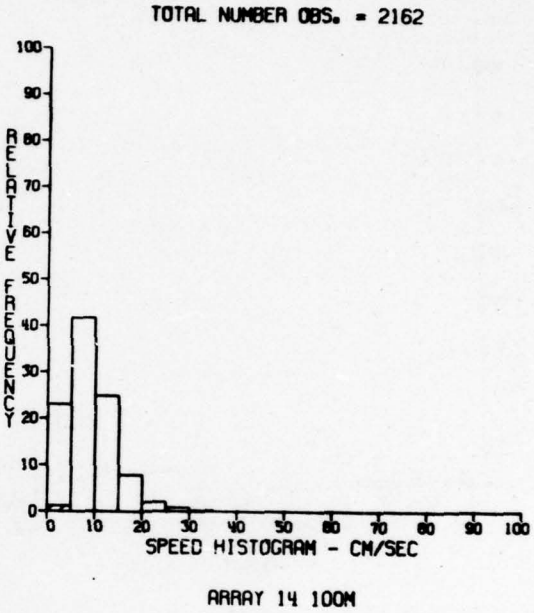
DIRECTION							SUM	PER.CT.
0- 15	69	9	5				83	4.6
15- 30	52	4	1	1			58	3.2
30- 45	34	5	1	1		1	42	2.4
45- 60	97	36	3	3			139	7.8
60- 75	61	59			3	1	124	6.9
75- 90	31	9	2		2		44	2.5
90-105	38	14	1				53	3.0
105-120	48		1	1			50	2.8
120-135	66	6	1				73	4.1
135-150	45	11					56	3.1
150-165	10						10	0.6
165-180	34		1				35	2.0
180-195	23						23	1.3
195-210	64	14	1				79	4.4
210-225	26	3					29	1.6
225-240	14	5					19	1.1
240-255	48	17					65	3.6
255-270	72	18	3				93	5.2
270-285	42	20					62	3.5
285-300	42	15					57	3.2
300-315	99	71	1				171	9.6
315-330	66	22					88	4.9
330-345	27	4				1	32	1.8
345-360	53	6	1				60	3.4

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	1161	348	22	6	5	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1545
PER.CT.	69.0	19.5	1.2	0.3	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

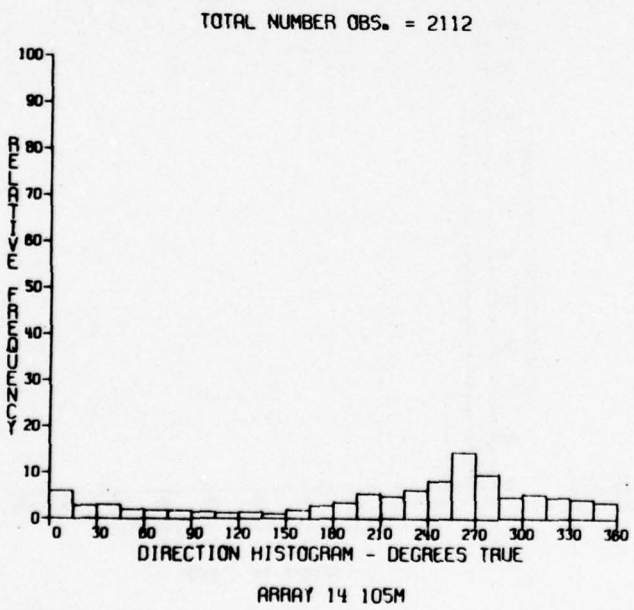
NUMBER OF ZERO SPEED AVERAGES = 241 PERCENTAGE ZERO SPEED AVERAGES = 13.5
TOTAL NUMBER OF OBS. = 1786


TOTAL NUMBER OBS. = 2135
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 14 100M

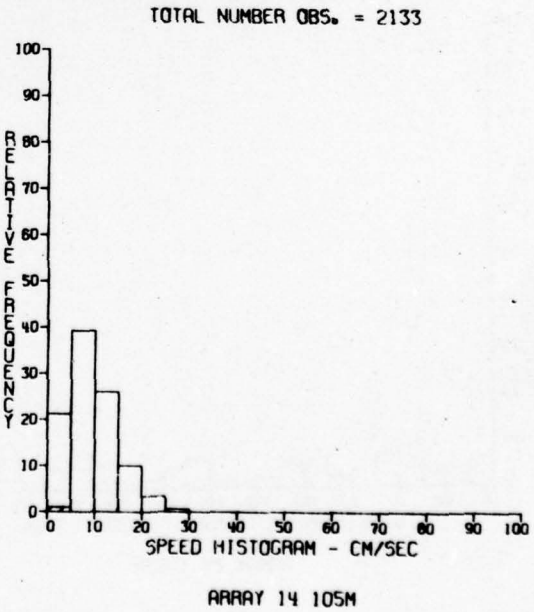
(a)


TOTAL NUMBER OBS. = 2162
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 14 100M

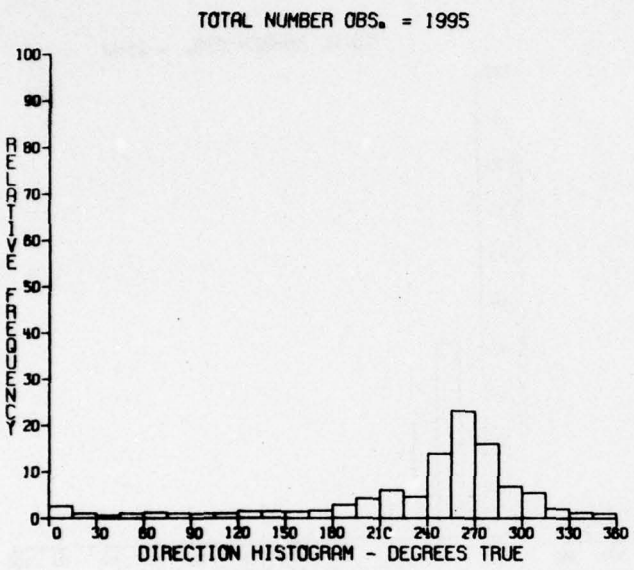
(b)


TOTAL NUMBER OBS. = 2112
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 14 105M

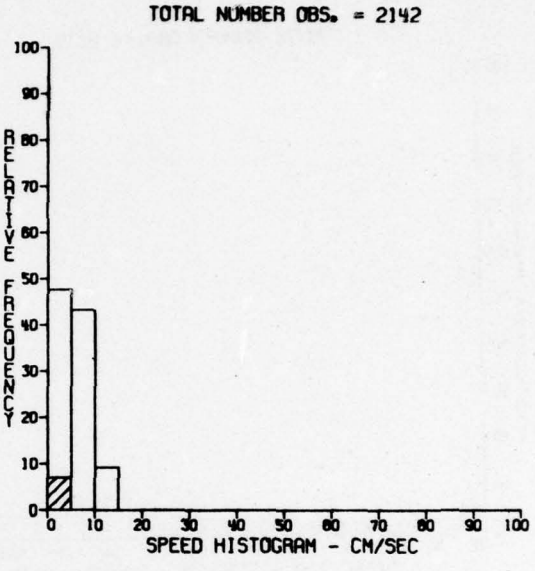
(c)


TOTAL NUMBER OBS. = 2133
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 14 105M

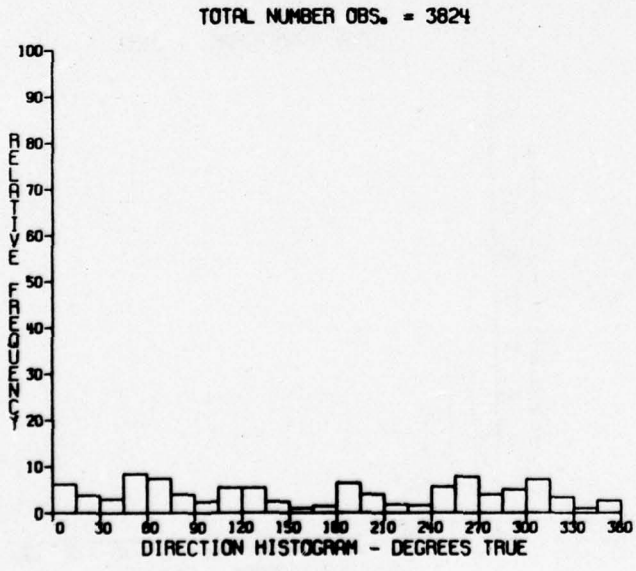
(d)


TOTAL NUMBER OBS. = 1995
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 14 810M

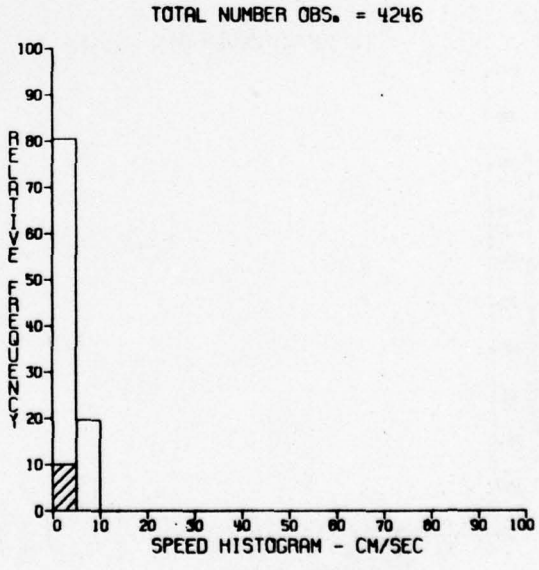
(a)


TOTAL NUMBER OBS. = 2142
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 14 810M

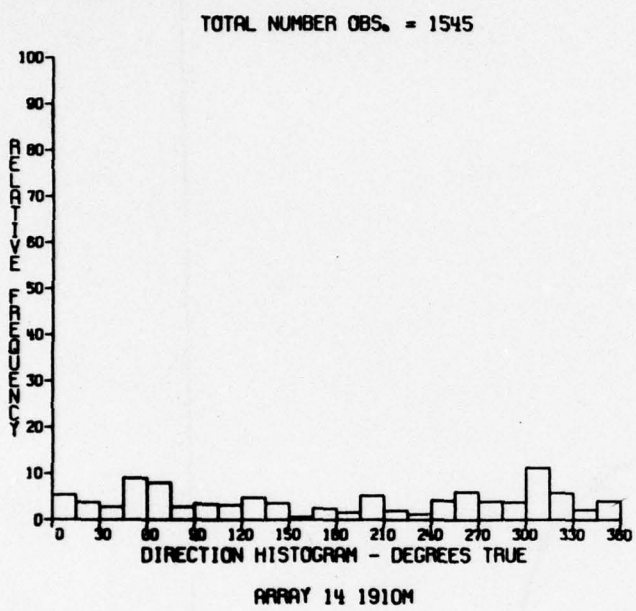
(b)


TOTAL NUMBER OBS. = 3824
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 14 1905M

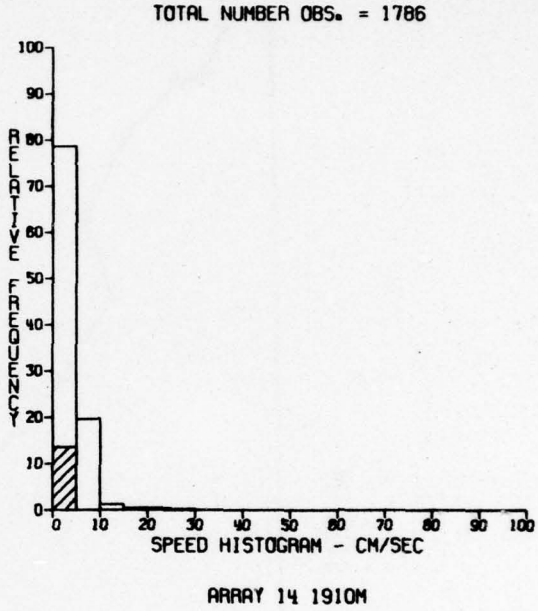
(c)


TOTAL NUMBER OBS. = 4246
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 14 1905M

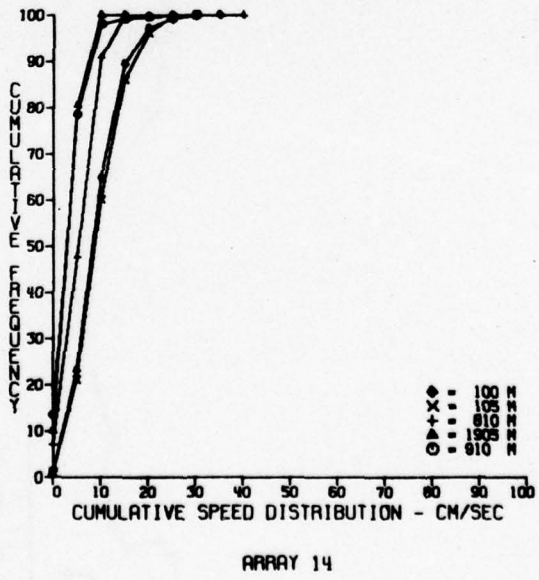
(d)


TOTAL NUMBER OBS. = 1545
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 14 1910M

(a)

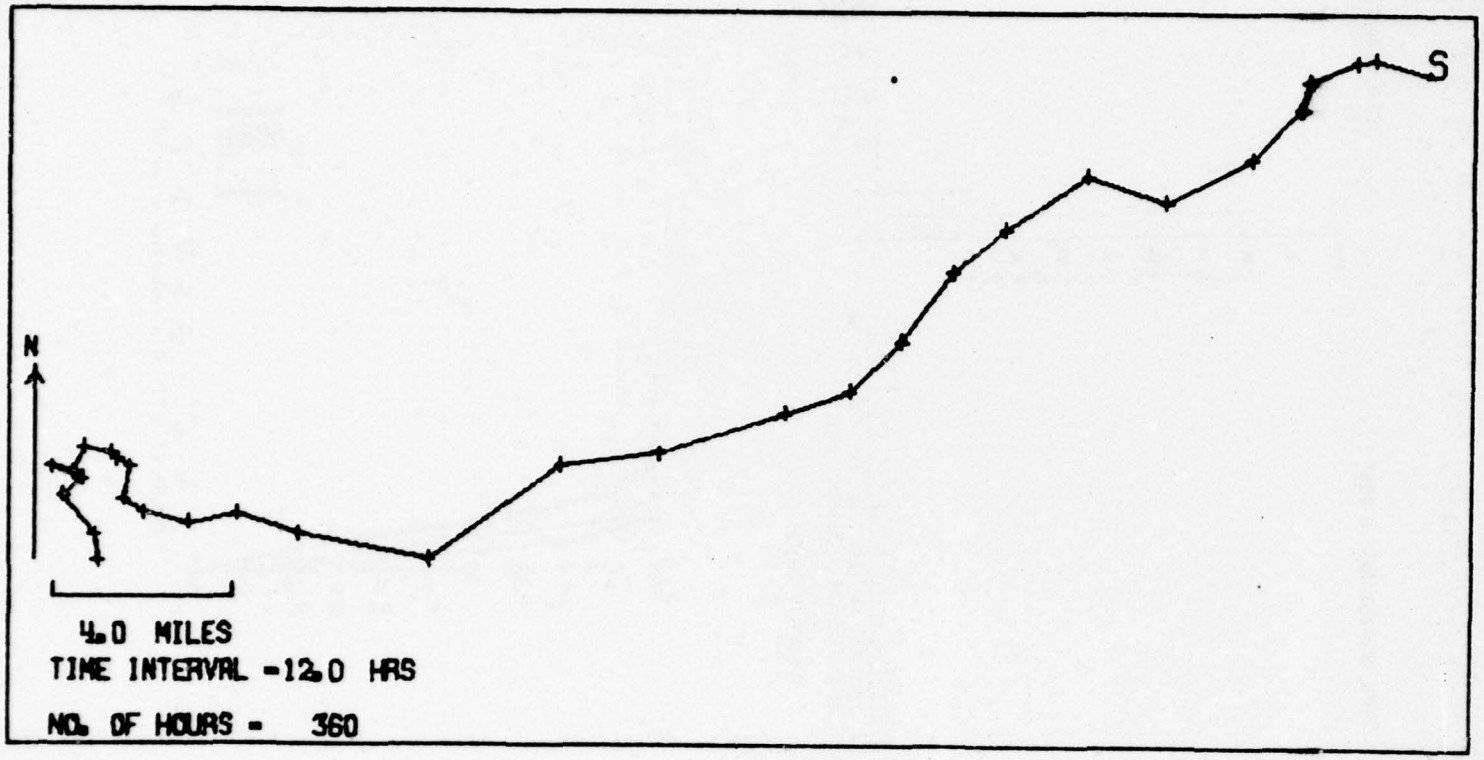

TOTAL NUMBER OBS. = 1786
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 14 1910M

(b)

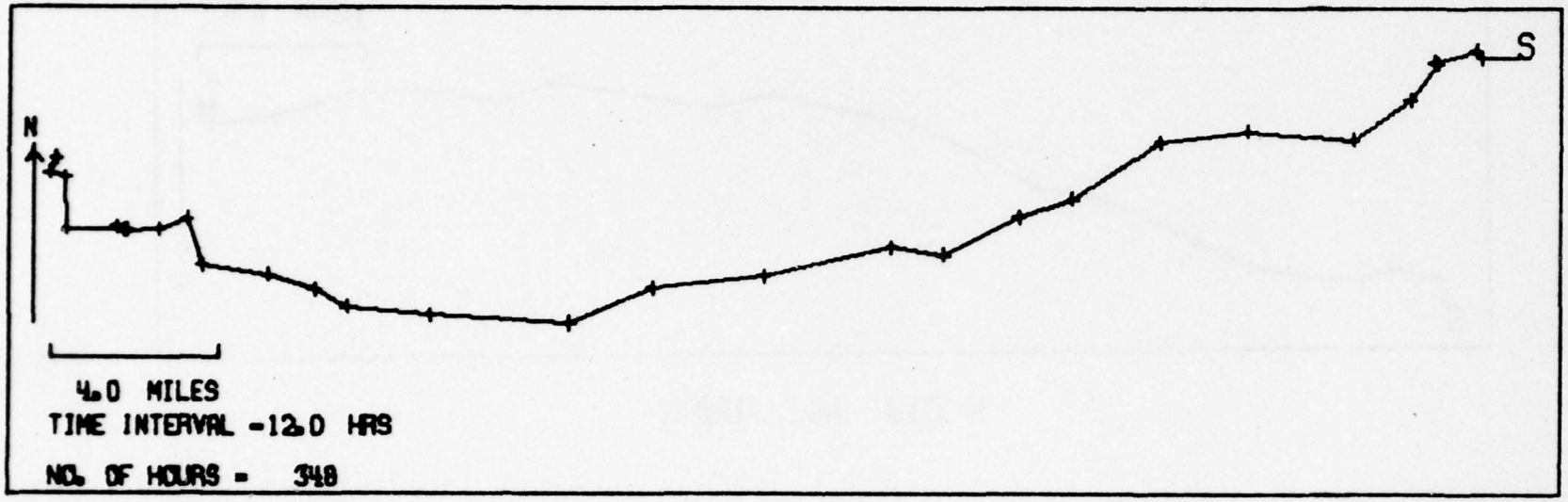

CUMULATIVE FREQUENCY
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 14

(c)

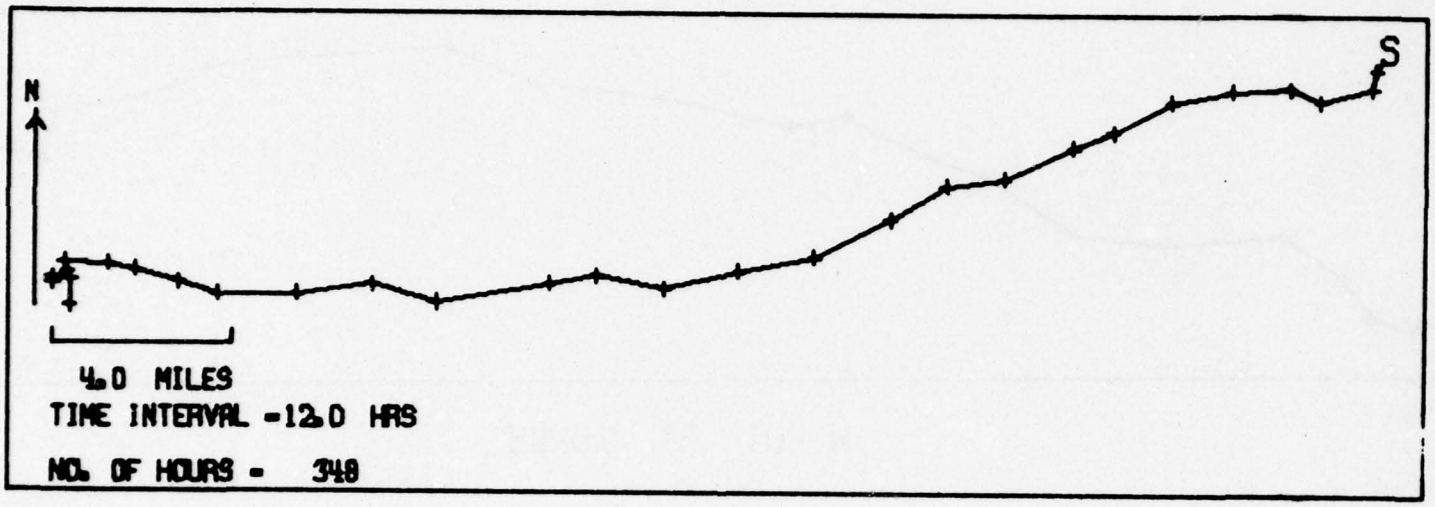
ARRAY 14 100 M



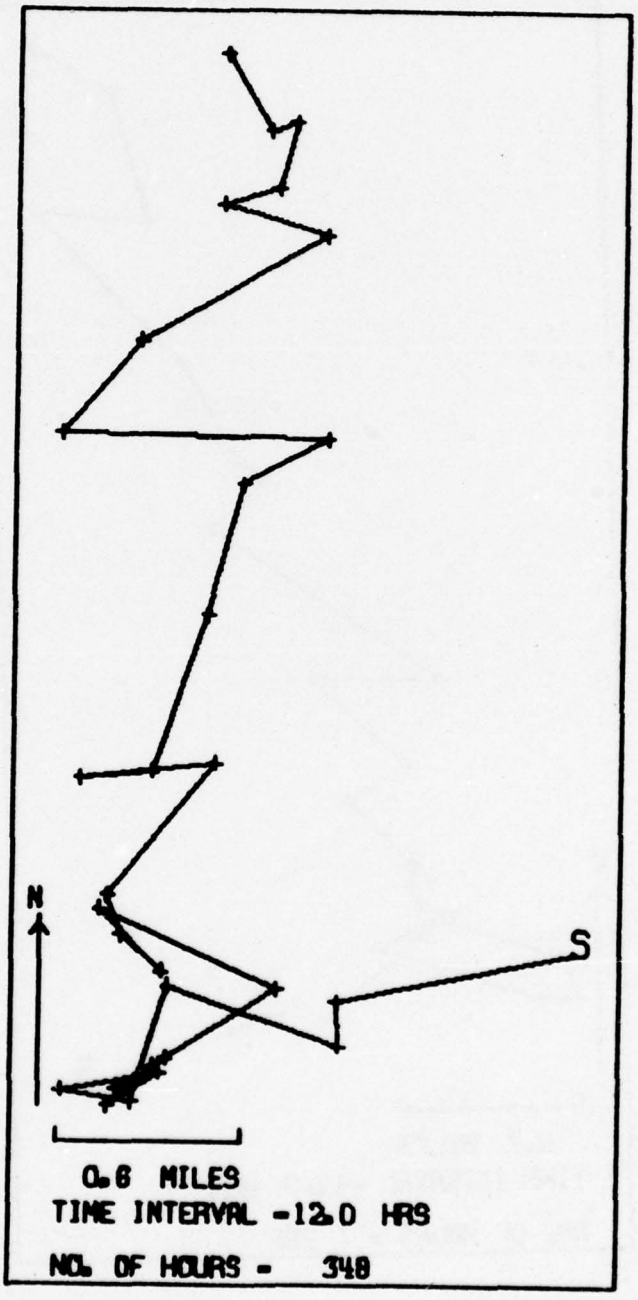
ARRAY 14 105 M



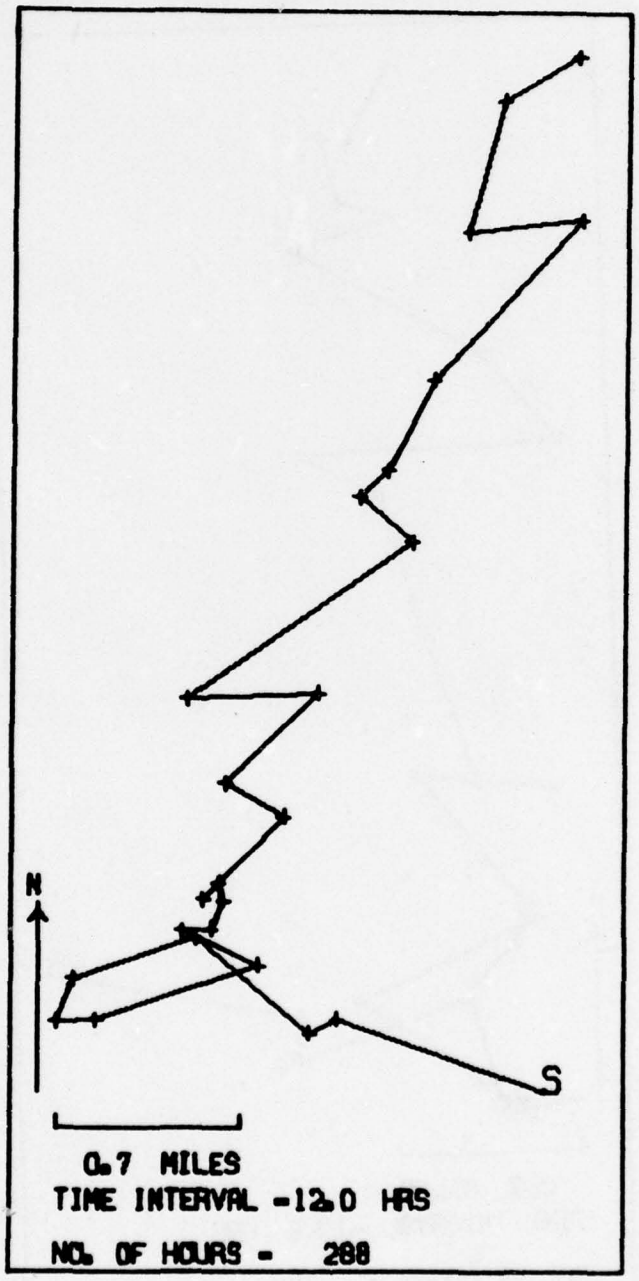
ARRAY 14 810 M

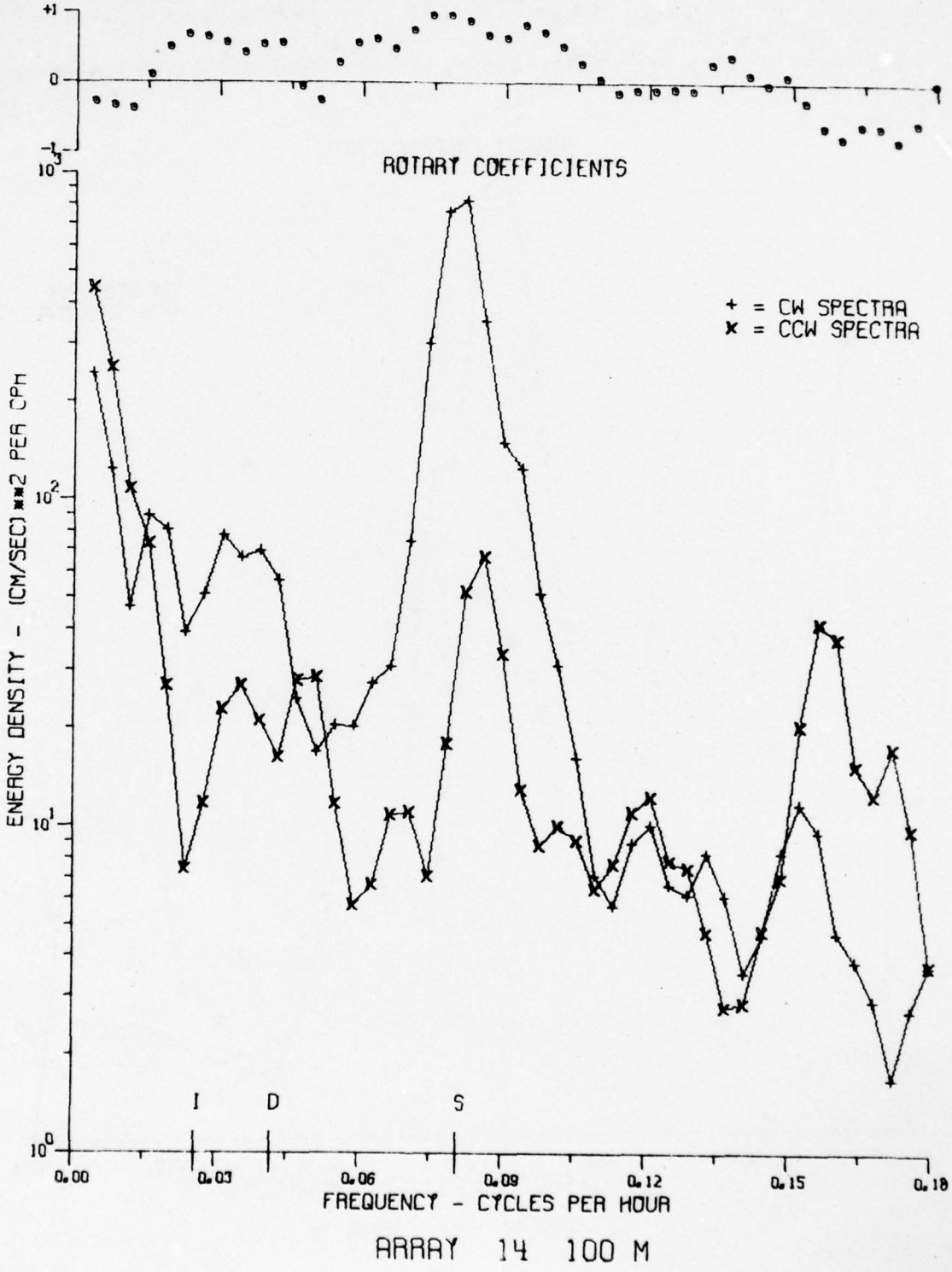


ARRAY 14 1905 M

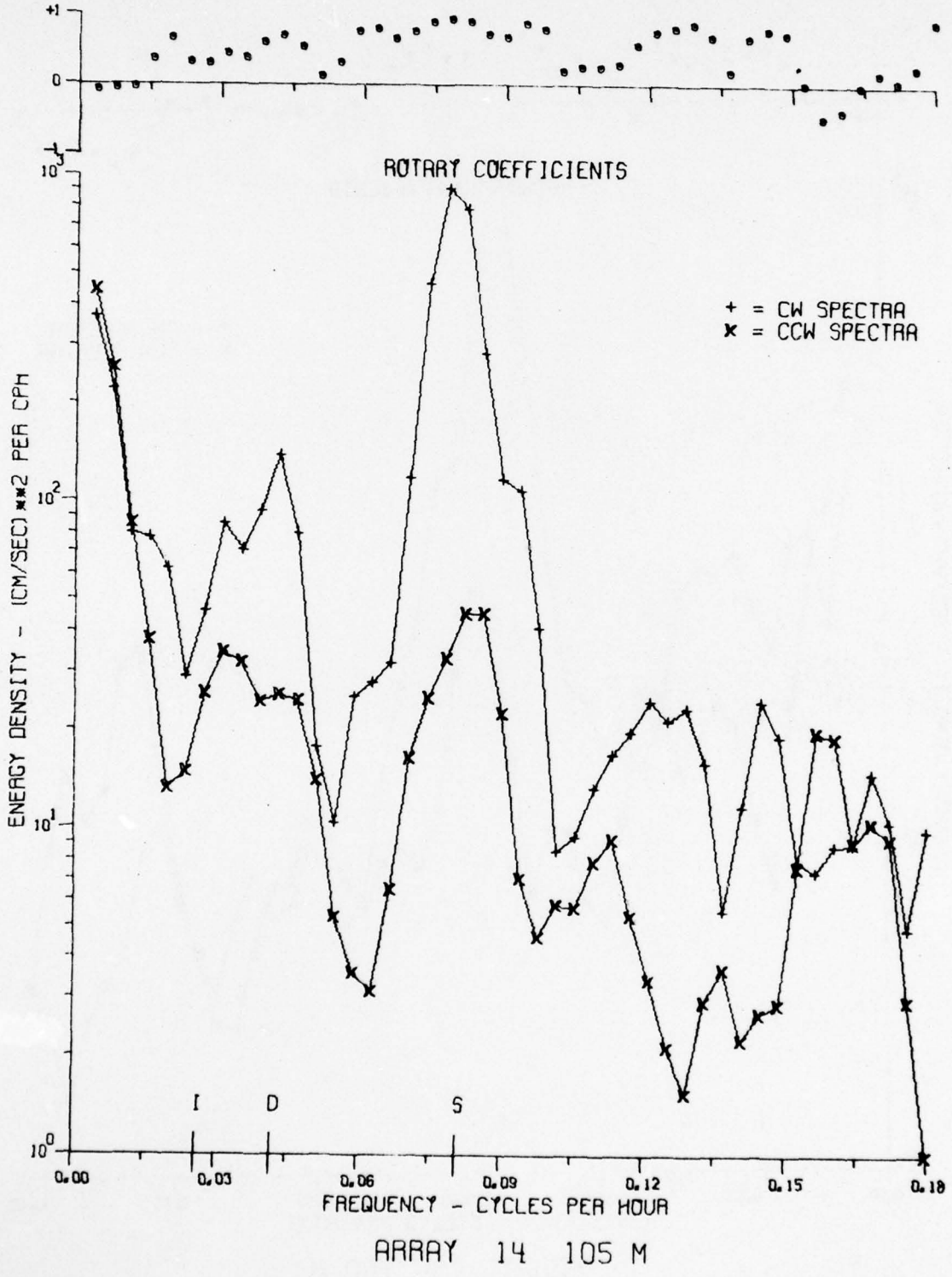


ARRAY 14 1910 M

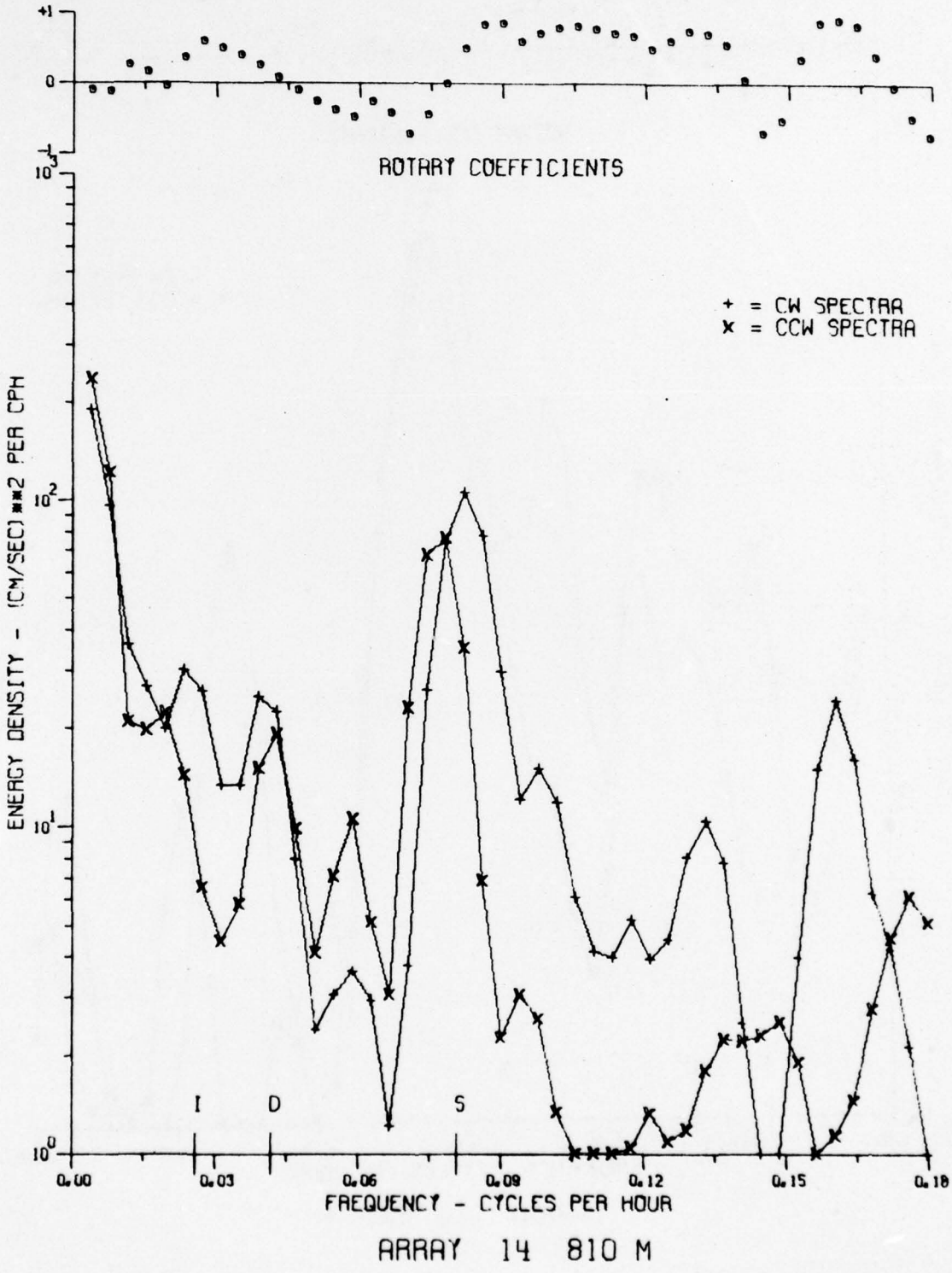


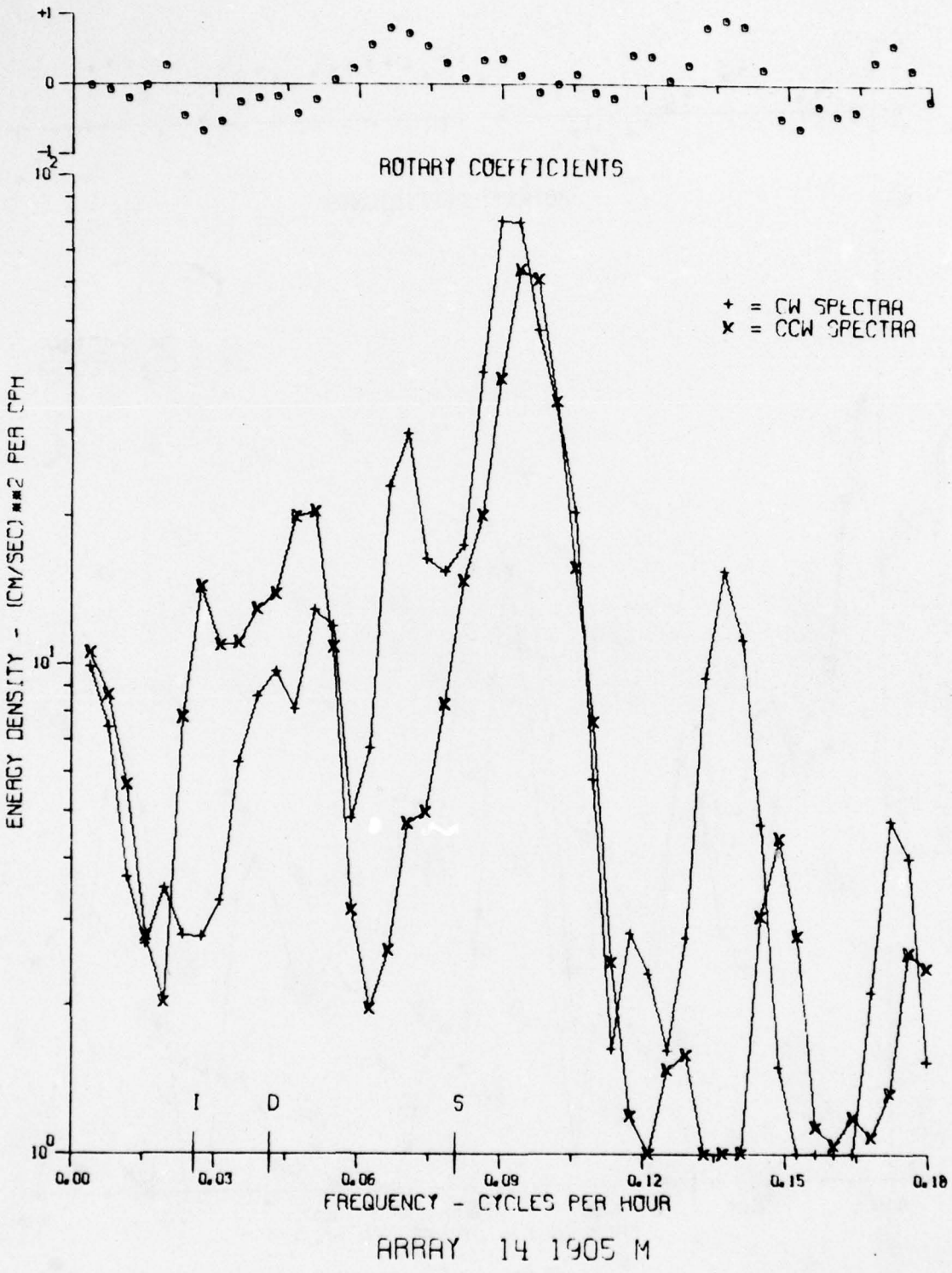


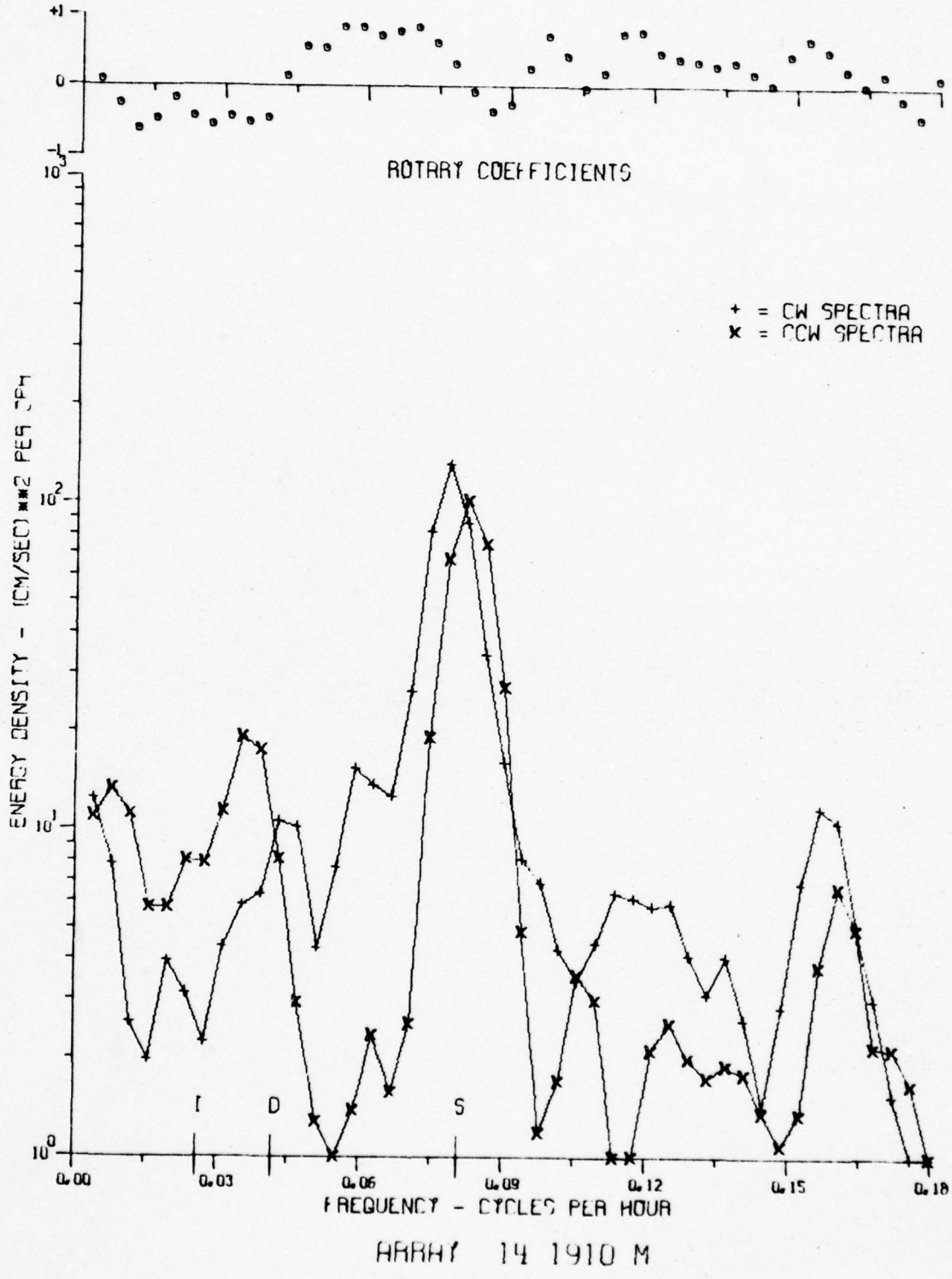
ARRAY 14 100 M



ARRAY 14 105 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 14 810 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC) **2 PER CPH
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 14 1905 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 14 1910 M

ARRAY 14A

CARIB GPS 17 58 24N 65 37 36W FILM 544 START TIME 1900Z 12/16/68 WATER DEPTH =1
430M SAMPLE DEPTH= 240M SAMPLE RATE 20MIN RECORD LENGTH=1249 HOURS

DIRECTION																						SUM	PER.CT.
0- 15	15	5	1																			21	0.6
15- 30	10	3																				13	0.3
30- 45	5																					5	0.1
45- 60	10	4		1																		15	0.4
60- 75	12	6				2						1										21	0.6
75- 90	12	5	1														1			1		20	0.5
90-105	10	15	3	1																		29	0.8
105-120	14	21	2																			37	1.0
120-135	20	22	2	1																		45	1.2
135-150	10	34	1			1																46	1.2
150-165	14	47	1																			62	1.7
165-180	20	27		1																		48	1.3
180-195	16	21	2																			39	1.0
195-210	15	18	1																			34	0.9
210-225	29	32	5	4																		70	1.9
225-240	33	62	57	9	1	1																163	4.3
240-255	31	131	145	36	5																	348	9.3
255-270	28	116	151	78	26		1															400	10.7
270-285	24	140	155	67	8	4																398	10.6
285-300	28	152	214	92	16	3	2		1			1										509	13.6
300-315	31	184	293	159	23	3						1										694	18.5
315-330	38	160	192	71	11	3						1										476	12.7
330-345	23	72	64	1	2																	162	4.3
345-360	20	8	1																			29	0.8

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	468	1285	1291	521	92	17	3	0	1	0	0	1	3	0	0	0	0	1	0	1		3684
PER.CT.	12.5	34.3	34.4	13.9	2.5	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0		

NUMBER OF ZERO SPEED AVERAGES = 66 PERCENTAGE ZERO SPEED AVERAGES = 1.8
TOTAL NUMBER OF OBS. = 3750

CARIB EPS 17 5R 24N 63 37 36W FILM 545 START TIME 1900Z 12/16/68 WATER DEPTH =1
430M SAMPLE DEPTH= 605M SAMPLE RATE 20MIN RECORD LENGTH= 286 HOURS

DIRECTION																	SUM	PER.CT.
0- 15	51	2															53	6.1
15- 30	55	1															56	6.5
30- 45	76	6	1														83	9.6
45- 60	107	20	2			1											130	15.1
60- 75	126	21	1		2	2	1										153	17.7
75- 90	103	9	2		3	1			2								119	13.8
90-105	46	6	2	4				1					1				62	7.2
105-120	40	3					1										44	5.1
120-135	15	2							1								18	2.1
135-150	14					1											15	1.7
150-165	6																6	0.7
165-180	2																2	0.2
180-195	3																3	0.3
195-210	1																1	0.1
210-225	6						1										7	0.8
225-240	8									1							9	1.0
240-255										1							1	0.1
255-270	4										1						5	0.6
270-285	14		1														15	1.7
285-300	8	2															10	1.2
300-315	3	5															8	0.9
315-330	12	1		1													14	1.6
330-345	12		1		1												14	1.6
345-360	11																11	1.3

SPEED	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	
SUM	723	79	10	5	6	5	3	1	3	2	1	0	1	0	0	0	0	0	0	0	0	839
PER.CT.	83.9	9.2	1.2	0.6	0.7	0.6	0.3	0.1	0.3	0.2	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

NUMBER OF ZERO SPEED AVERAGES = 23 PERCENTAGE ZERO SPEED AVERAGES = 2.7
TOTAL NUMBER OF OBS. = 862

CARIB 6RS 17 98 24N 65 37 36W FILM 546 START TIME 1900Z 12/16/68 WATER DEPTH =1
430M SAMPLE DEPTH=133M SAMPLE RATE 20MIN RECORD LENGTH=1245 HOURS

DIRECTION				SUM	PER.CT.
0- 15	100	19		119	3.2
15- 30	87	25	1	113	3.0
30- 45	71	32		103	2.8
45- 60	94	32		126	3.4
60- 75	105	88	3	196	5.2
75- 90	119	85	6	210	5.6
90-105	120	71	2	193	5.2
105-120	96	61		157	4.2
120-135	76	40	2	118	3.2
135-150	69	24		93	2.5
150-165	45	12		57	1.5
165-180	46	17		63	1.7
180-195	47	11		58	1.6
195-210	62	6		68	1.8
210-225	69	10		79	2.1
225-240	69	19		88	2.4
240-255	82	39	1	122	3.3
255-270	110	64	8	182	4.9
270-285	119	75	5	199	5.3
285-300	138	81	11	230	6.2
300-315	152	70	6	228	6.1
315-330	129	54	8	191	5.1
330-345	89	46	3	138	3.7
345-360	70	18		88	2.4

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	2164	999	56	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3219
PER.CT.	57.9	26.7	1.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

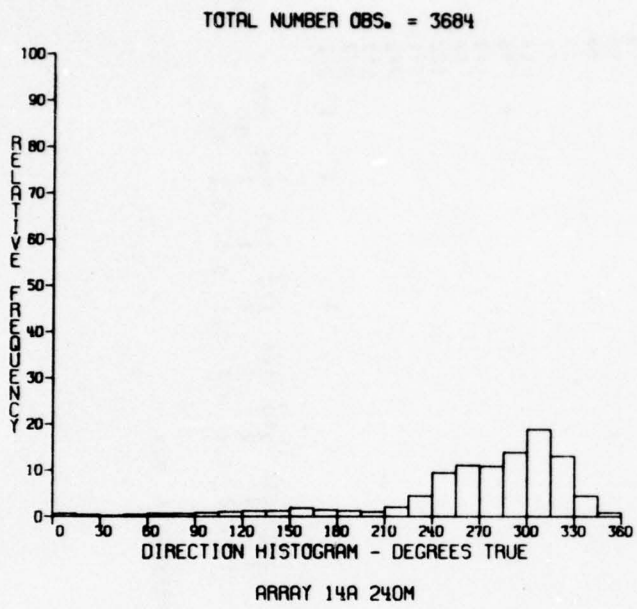
NUMBER OF ZERO SPEED AVERAGES = 519 PERCENTAGE ZERO SPEED AVERAGES = 13.9
TOTAL NUMBER OF OBS. = 3738

CARIB EPS 17 56 24N 65 37 36W FILM 543 START TIME 1900Z 12/16/68 WATER DEPTH =1
430M SAMPLE DEPTH=1420M SAMPLE RATE 20MIN RECORD LENGTH=1242 HOURS

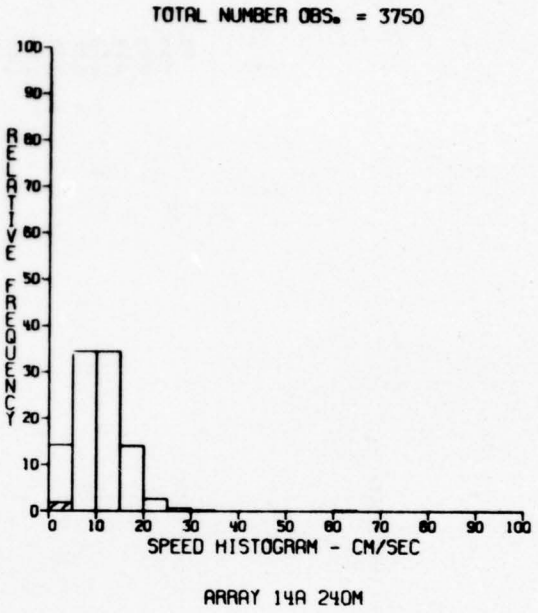
DIRECTION																						SUM	PER.CT.
0- 15	81	10		3	1					2												97	2.6
15- 30	100	57	3	2		1		1														164	4.4
30- 45	186	145	19	3								1		2								358	9.6
45- 60	219	109	4	2	1			1	1	1			1	1								334	9.0
60- 75	176	55	1	2	3	1	1	1	3	2	1			1	1					1	1	253	6.8
75- 90	219	67		6	3						1	3		2		1	1				4	307	8.2
90-105	93	19	1		1			1		2			1	1							1	120	3.2
105-120	86	12		1							1				1	1					1	103	2.8
120-135	132	6							1		1			1		1		1			1	144	3.9
135-150	77	2	1			1		1				1										83	2.2
150-165	58	2	1	1			2															64	1.7
165-180	58	4	1								1											64	1.7
180-195	26	1																				27	0.7
195-210	43	2	1								1											47	1.3
210-225	60	1	2						1													64	1.7
225-240	49			1		1	1		1	1			1								1	56	1.5
240-255	47				1																	48	1.3
255-270	66																					66	1.8
270-285	118		2																			120	3.2
285-300	179	11	1																			191	5.1
300-315	231	7	1		1	3																243	6.5
315-330	143	3			1	1																148	4.0
330-345	116	3	1		1	1																122	3.3
345-360	144	7	2	2		1				2		1						1		1	1	162	4.3

SPEED	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200		
SUM	2705	524	41	23	13	10	4	5	7	10	6	6	3	8	2	3	2	1	2	10		3385	
PER.CT.	72.5	14.0	1.1	0.6	0.3	0.3	0.1	0.1	0.2	0.3	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.0	0.1	0.3			

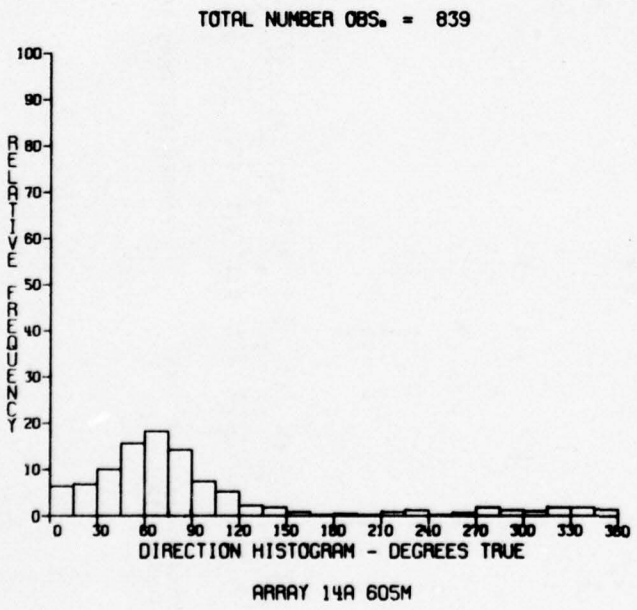
NUMBER OF ZERO SPEED AVERAGES = 345 PERCENTAGE ZERO SPEED AVERAGES = 9.2
TOTAL NUMBER OF OBS. = 3730


TOTAL NUMBER OBS. = 3684
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 14A 240M

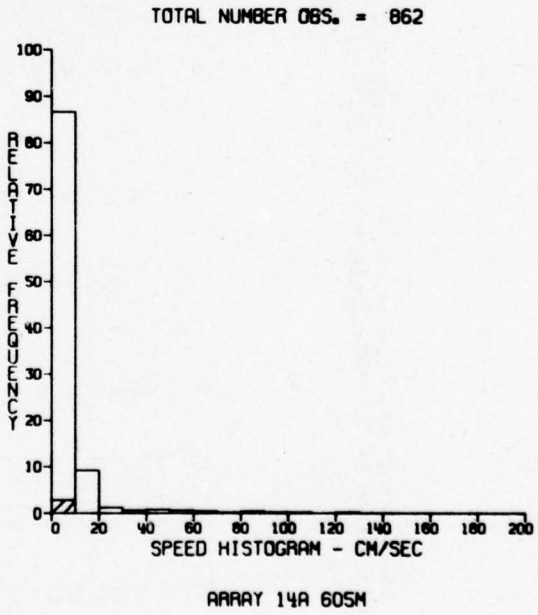
(a)


TOTAL NUMBER OBS. = 3750
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 14A 240M

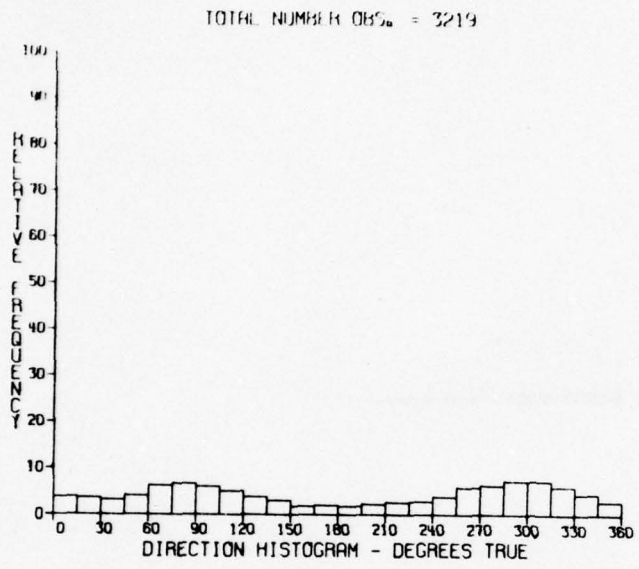
(b)


TOTAL NUMBER OBS. = 839
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 14A 605M

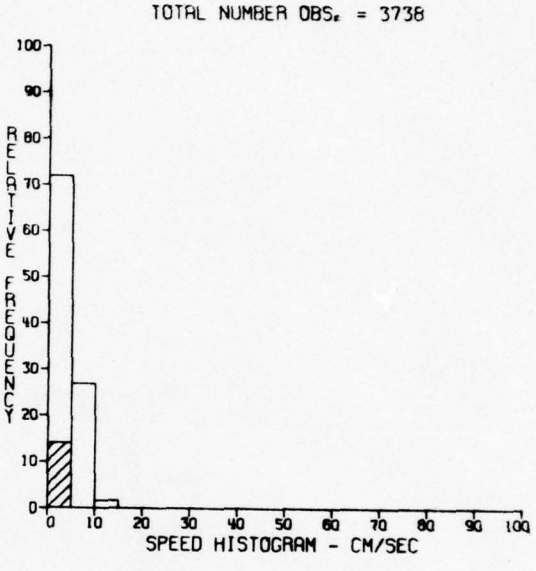
(c)


TOTAL NUMBER OBS. = 862
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 20 40 60 80 100 120 140 160 180 200
SPEED HISTOGRAM - CM/SEC
ARRAY 14A 605M

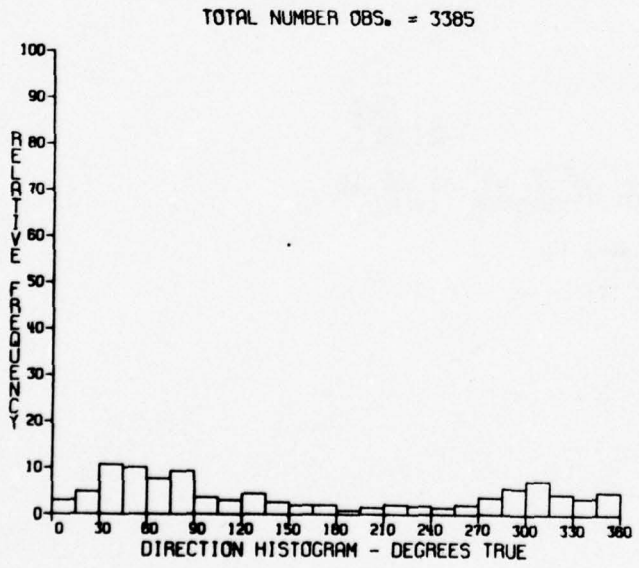
(d)


TOTAL NUMBER OBS. = 3219
RELATIVE FREQUENCY
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 14A 1335M

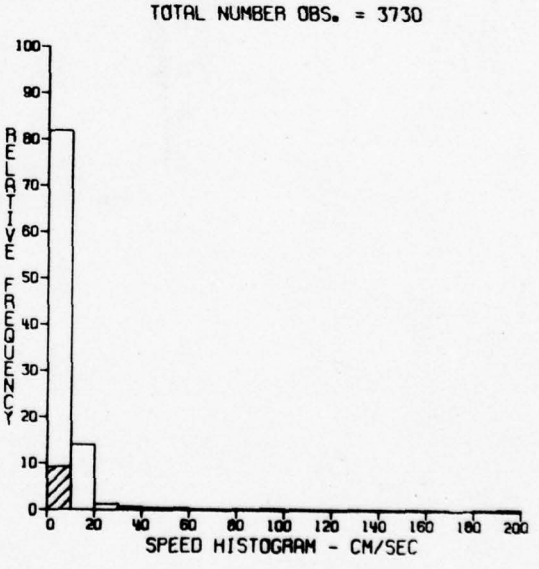
(a)


TOTAL NUMBER OBS. = 3738
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 14A 1335M

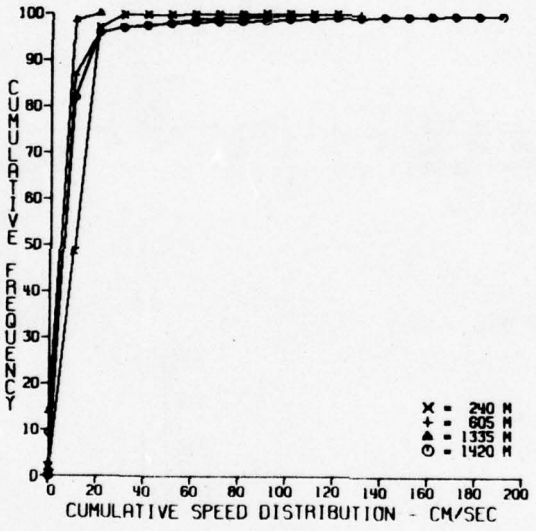
(b)


TOTAL NUMBER OBS. = 3385
RELATIVE FREQUENCY
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 14A 1420M

(c)

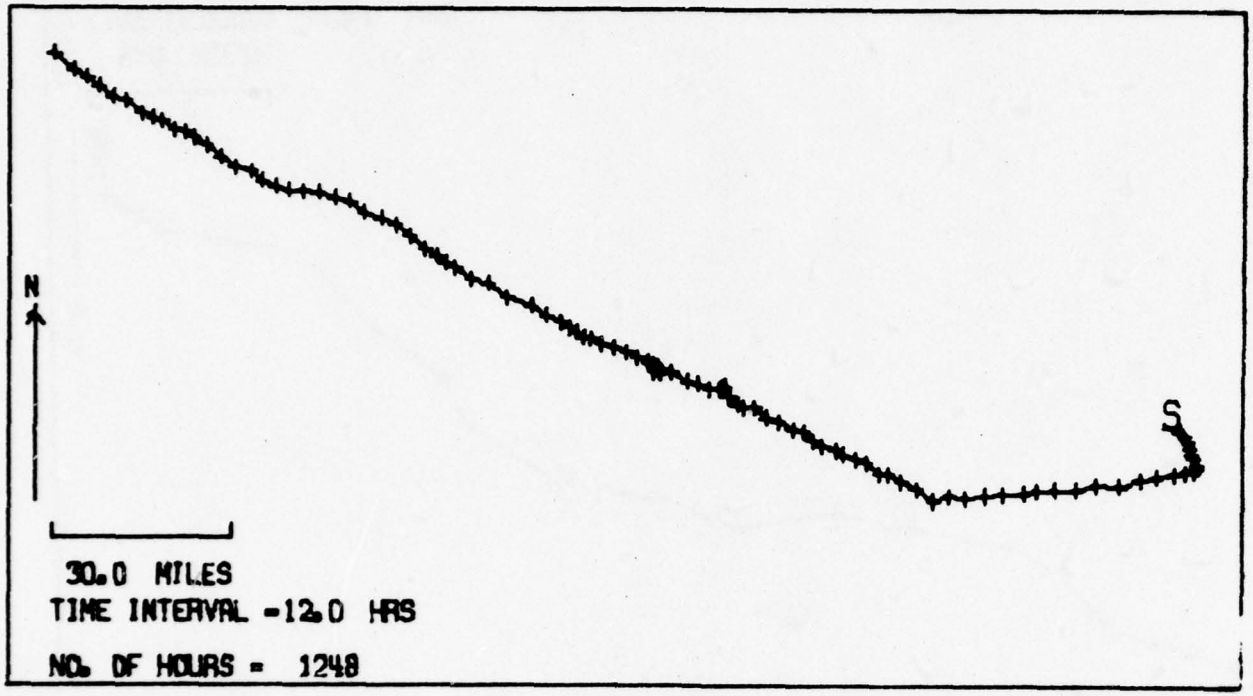

TOTAL NUMBER OBS. = 3730
RELATIVE FREQUENCY
0 20 40 60 80 100 120 140 160 180 200
SPEED HISTOGRAM - CM/SEC
ARRAY 14A 1420M

(d)

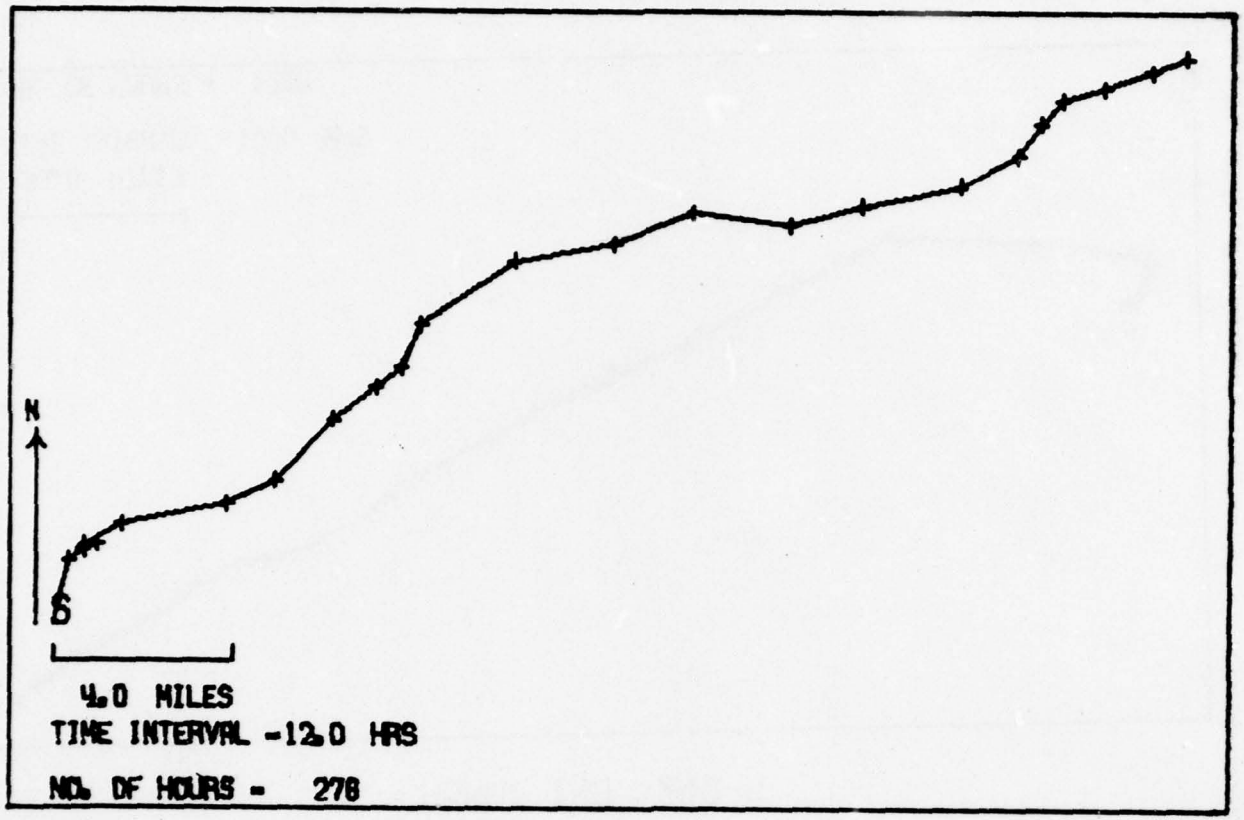

CUMULATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0
20
40
60
80
100
120
140
160
180
200
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
X = 240 M
+ = 605 M
▲ = 1335 M
⊙ = 1420 M

ARRAY 14A

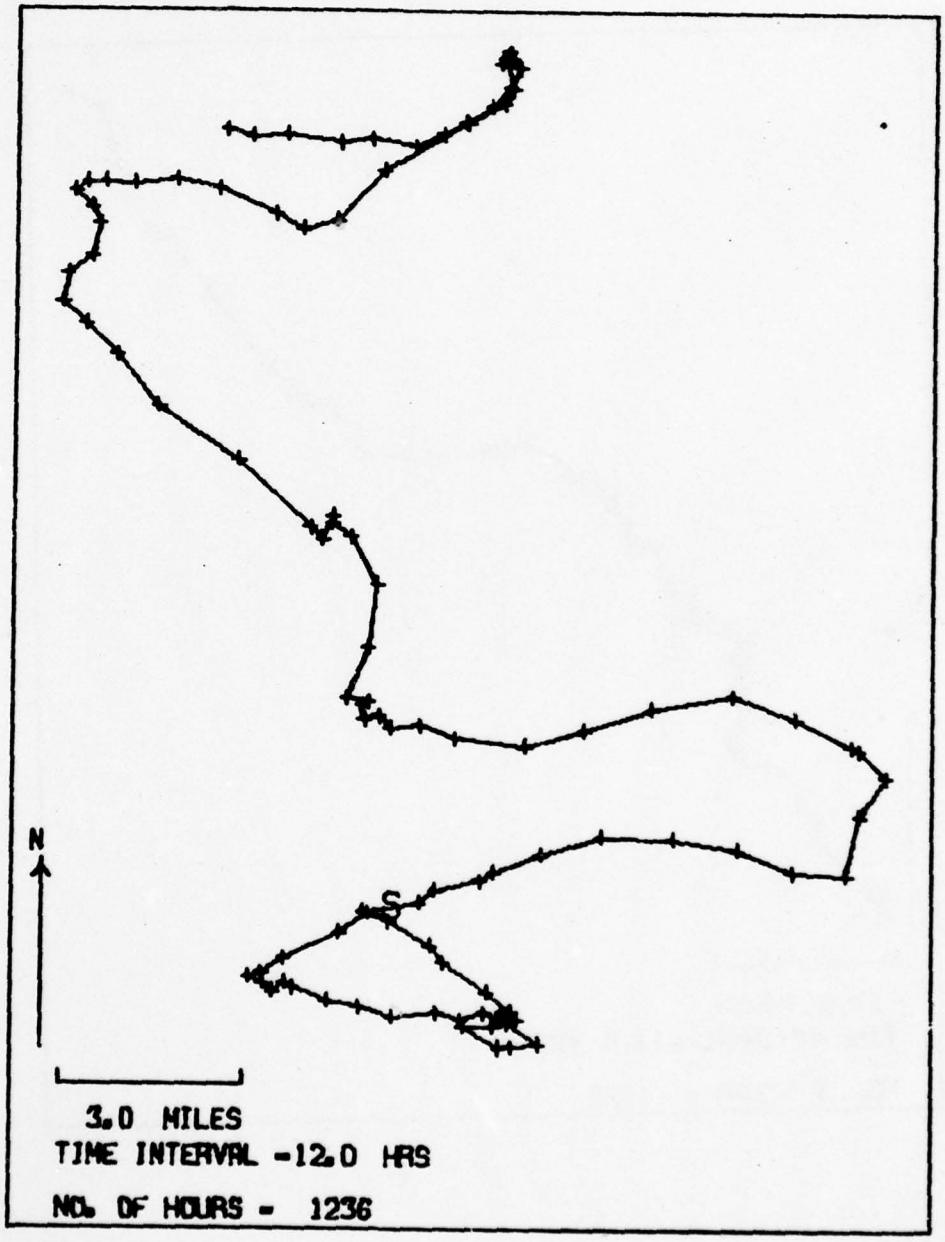
ARRAY 14A 240 M



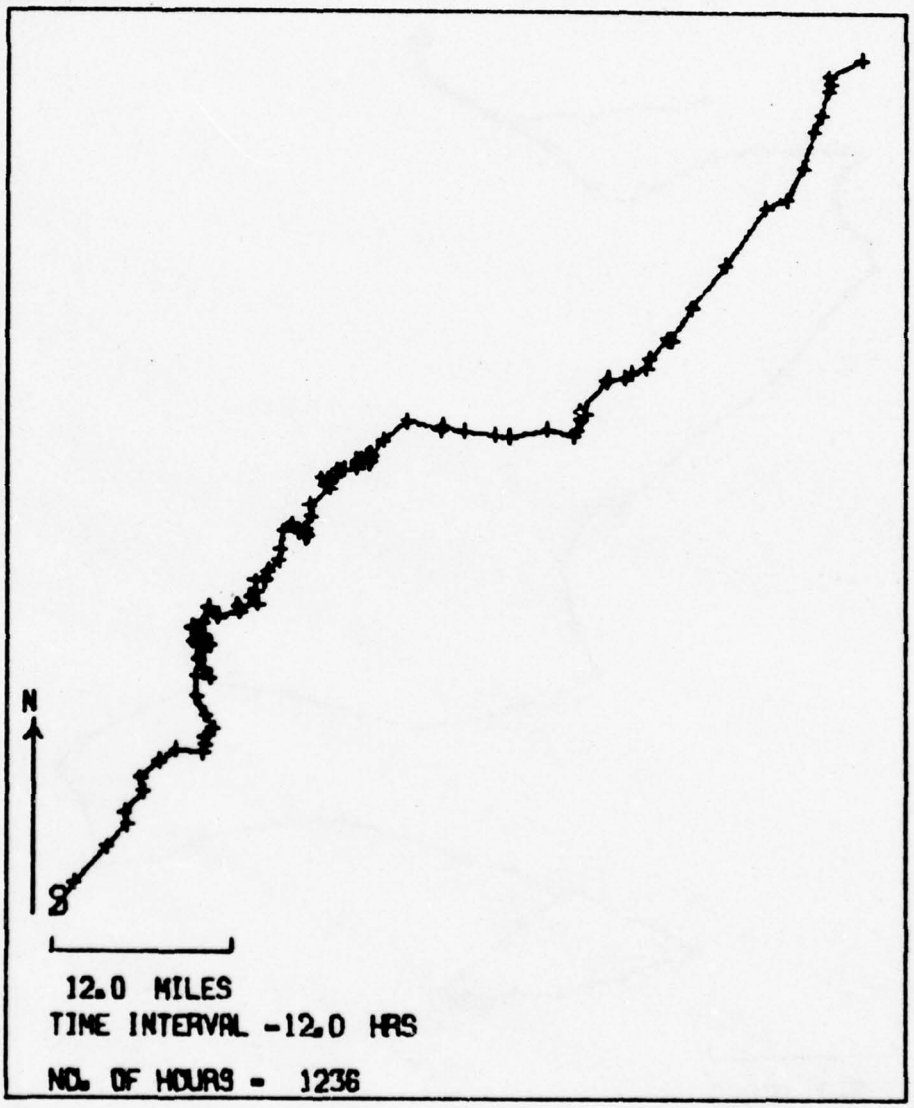
ARRAY 14A 605 M

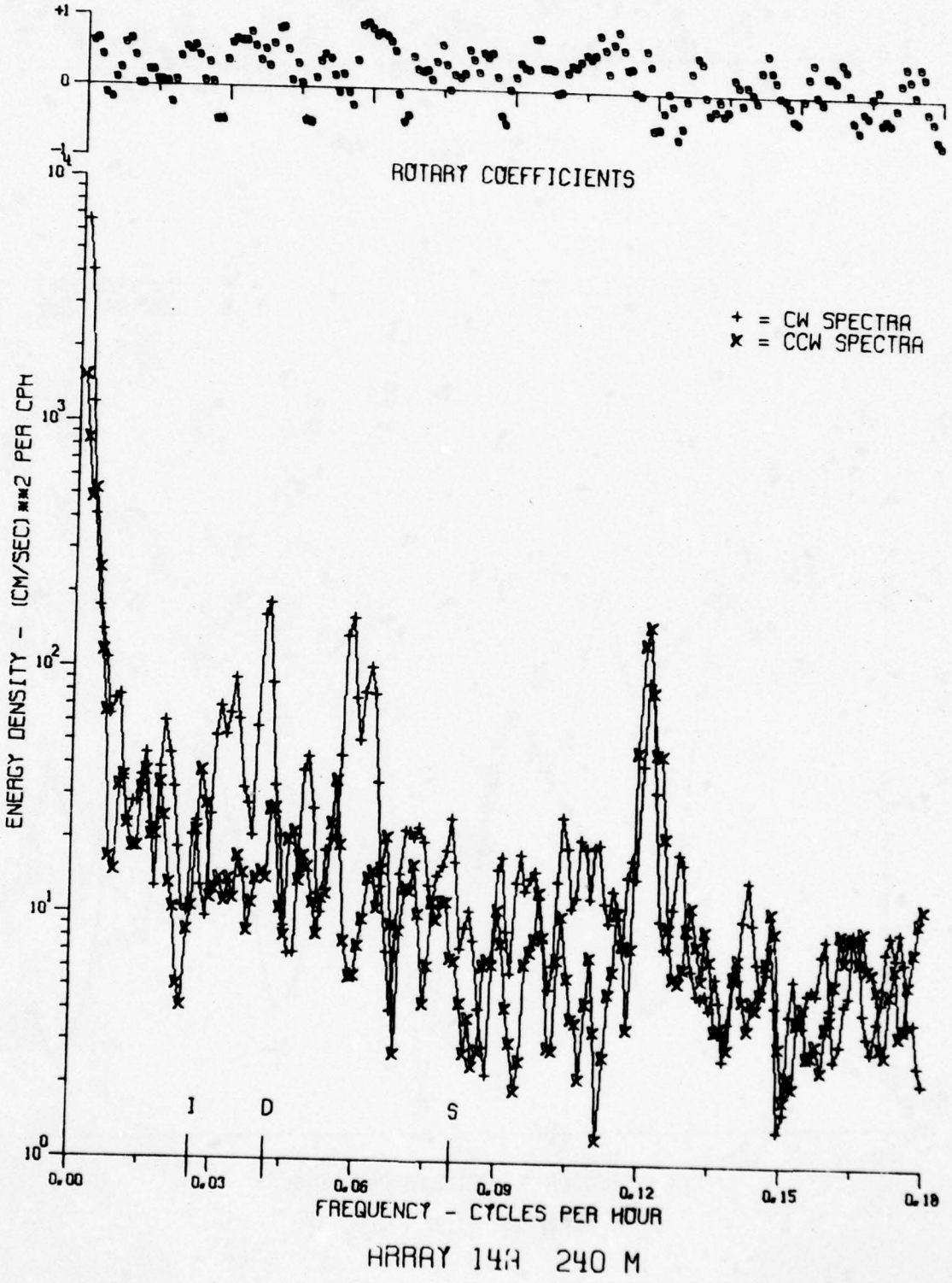


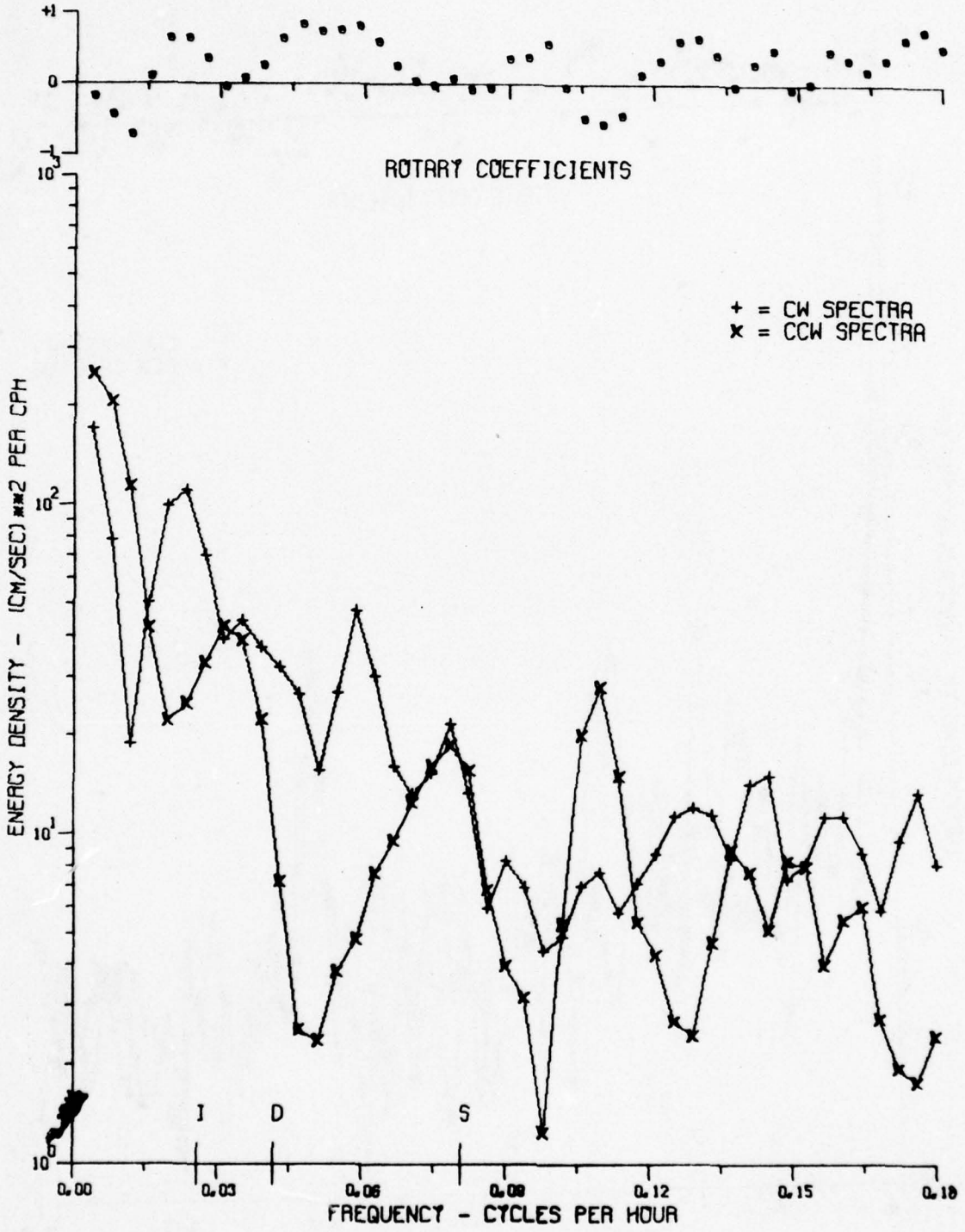
ARRAY 14A 1335 M



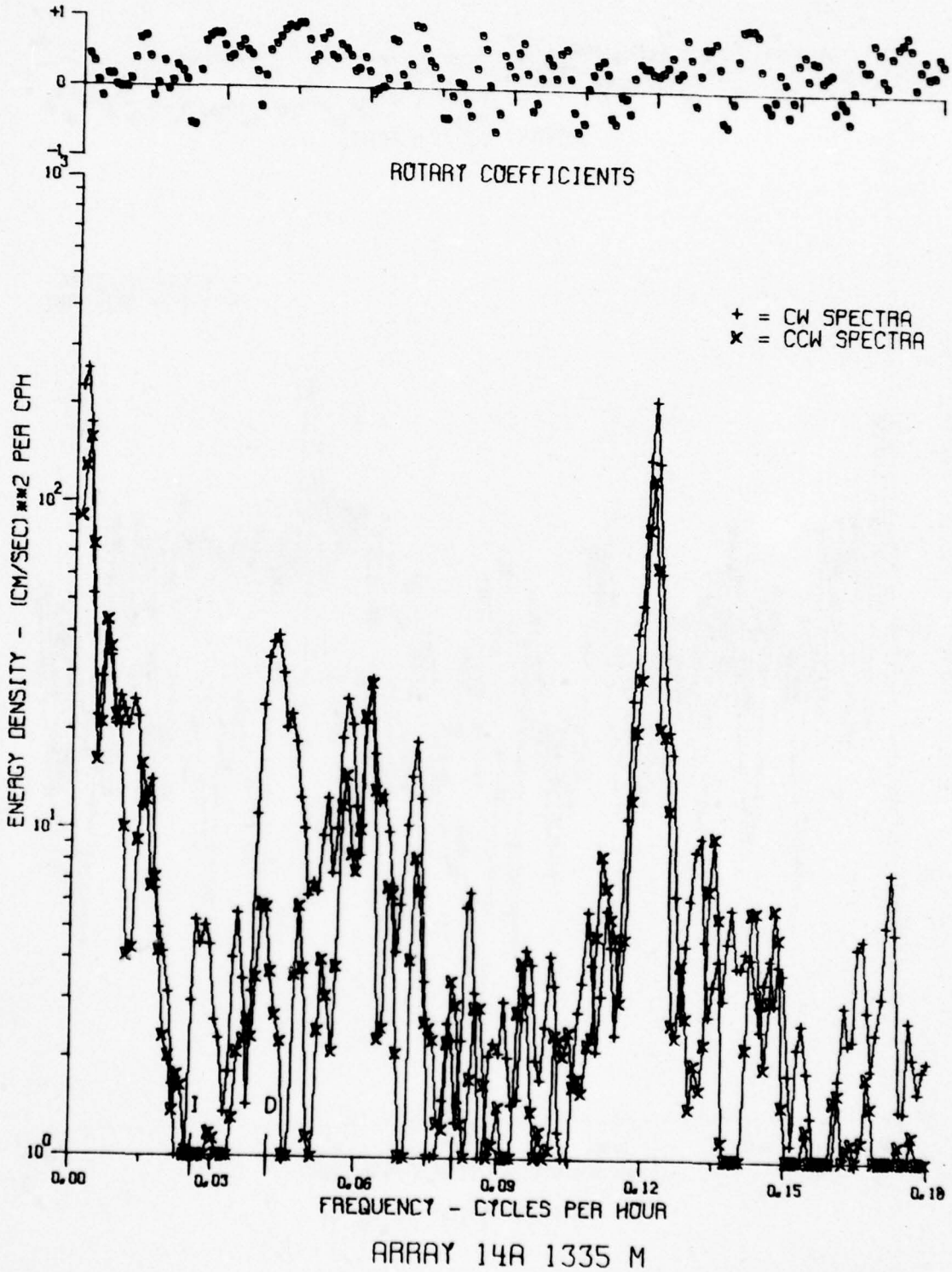
ARRAY 14A 1420 M



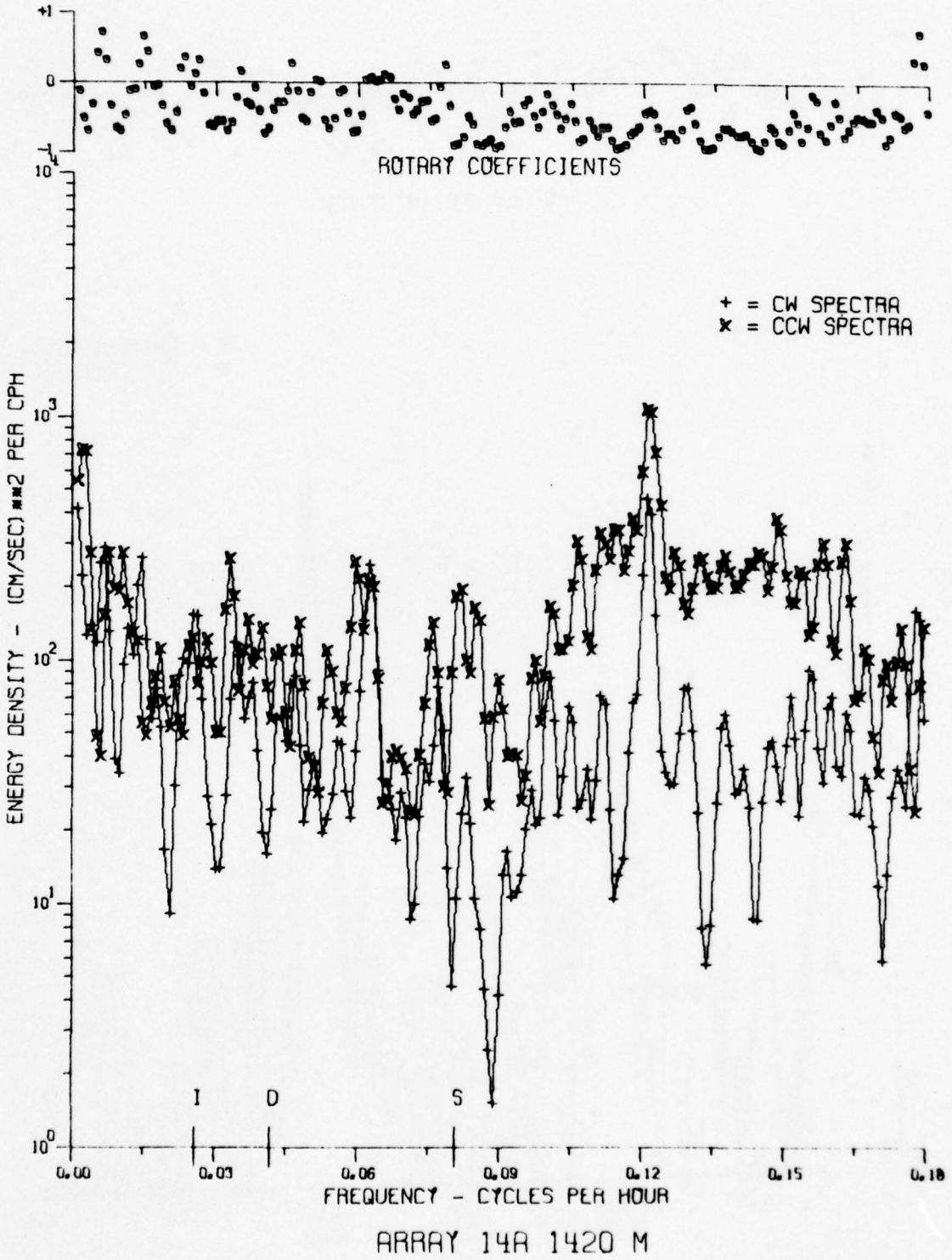

+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 14A 240 M



ARRAY 14A 605 M



ARRAY 14A 1335 M



ARRAY 14A 1420 M

ARRAY 14B

CARIB OBS 18 02 24N 65 33 34W FILM 547 START TIME 1600Z 12/16/68 WATER DEPTH =
60CM SAMPLE DEPTH= 25CM SAMPLE RATE 20MIN RECORD LENGTH=126C HOURS

DIRECTION							SUM	PER.CT.
0- 15	30	6	1				37	1.0
15- 30	14	2					16	0.4
30- 45	17	2	1	1			21	0.6
45- 60	21	11	4	1			37	1.0
60- 75	24	18	3	1	1	1	48	1.3
75- 90	27	37	4	1			69	1.8
90-105	37	44	17	5			103	2.7
105-120	23	35	26	17	1		102	2.7
120-135	19	26	31	12	2	1	91	2.4
135-150	22	30	12	3			67	1.8
150-165	24	26	14				64	1.7
165-180	21	30	2				53	1.4
180-195	28	56	3				87	2.3
195-210	46	50	16	4			116	3.1
210-225	35	61	15	8	1		120	3.2
225-240	40	60	60	16	1		177	4.7
240-255	47	102	97	48	7		301	8.0
255-270	45	134	113	39	9	2	342	9.0
270-285	73	148	131	54	10	1	417	11.0
285-300	69	129	128	93	13	4	436	11.5
300-315	62	121	125	49	1		358	9.5
315-330	56	127	85	45	4		317	8.4
330-345	42	70	28	11	1	1	153	4.0
345-360	40	25	3	1			69	1.8

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	802	1350	919	409	51	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3601
PER.CT.	22.8	35.7	24.3	10.8	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

NUMBER OF ZERO SPEED AVERAGES = 181 PERCENTAGE ZERO SPEED AVERAGES = 4.8
TOTAL NUMBER OF OBS. = 3782

CARIB EPS 18 02 24N 65 35 54W FILM 548 START TIME 1600Z 12/16/68 WATER DEPTH = 960M SAMPLE DEPTH= 955M SAMPLE RATE 20MIN RECORD LENGTH= 642 HOURS

DIRECTION																					SUM	PER.CT.
0- 15	41	1	1			2	2	1	2	1		1									52	2.7
15- 30	26	1	1	5	2		2	1		1		1	3				1				44	2.3
30- 45	43	2	1	1	3	1	3	1	1												56	2.9
45- 60	36	4	1	2	1		1	2		1						1					51	2.6
60- 75	33	4	4	2	2	1	1	2	1			1									51	2.6
75- 90	61	12	1		2	4		4	1	1	1										87	4.5
90-105	55	18	1	1			1	2						1							79	4.1
105-120	77	15	2		2			3			1										100	5.2
120-135	81	38	15				1	1	1	2							1	1			141	7.3
135-150	50	8	1			1	1			1	1		1								64	3.3
150-165	35	4					1			2			1								47	2.4
165-180	28	4							1												33	1.7
180-195	40	3			2						1			1							47	2.4
195-210	39	5		2			1														47	2.4
210-225	50	3					2		2	1	2			1							61	3.2
225-240	32	3	1	1				1			1							1			40	2.1
240-255	72	10			2	1											1				86	4.5
255-270	109	35	2	1			1														148	7.7
270-285	154	45	4			3		1													207	10.7
285-300	105	34	6	1	4	3			1		1		1	1							157	8.1
300-315	67	10	2	2	1	2		1					1		1						87	4.5
315-330	51	6			1				1			2	1								62	3.2
330-345	55				1					1											57	3.0
345-360	28	4	1	1			1			1											37	1.9

SPEED	0	10	20	30	40	50	60	70	80	90	100	110	120	130	140	150	160	170	180	190	200	
SUM	1375	269	44	19	23	18	18	20	11	12	8	5	8	4	2	3	1	1	0	0		1841
PER.CT.	71.2	13.9	2.3	1.0	1.2	0.9	0.9	1.0	0.6	0.6	0.4	0.3	0.4	0.2	0.1	0.2	0.1	0.1	0.0	0.0		

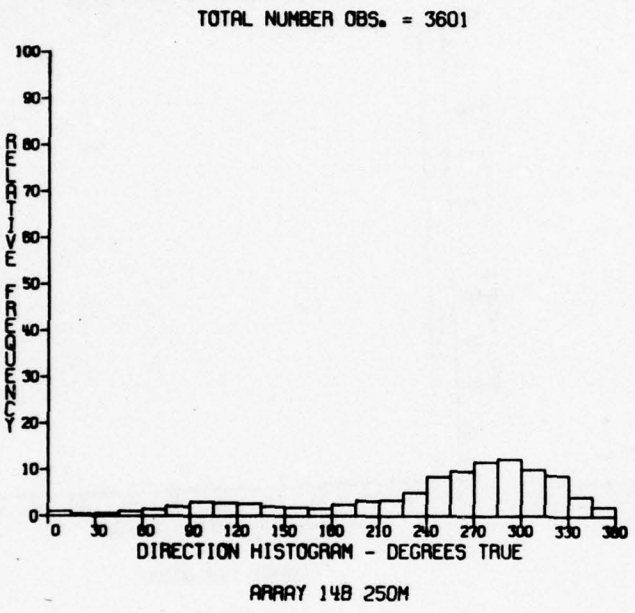
NUMBER OF ZERO SPEED AVERAGES = 89 PERCENTAGE ZERO SPEED AVERAGES = 4.6
TOTAL NUMBER OF OBS. = 1930

CARIB BPS 18 02 24N 65 35 54W FILM 549 START TIME 1600Z 12/16/68 WATER DEPTH =
98CM SAMPLE DEPTH= 97CM SAMPLE RATE 20MIN RECORD LENGTH=1249 HOURS

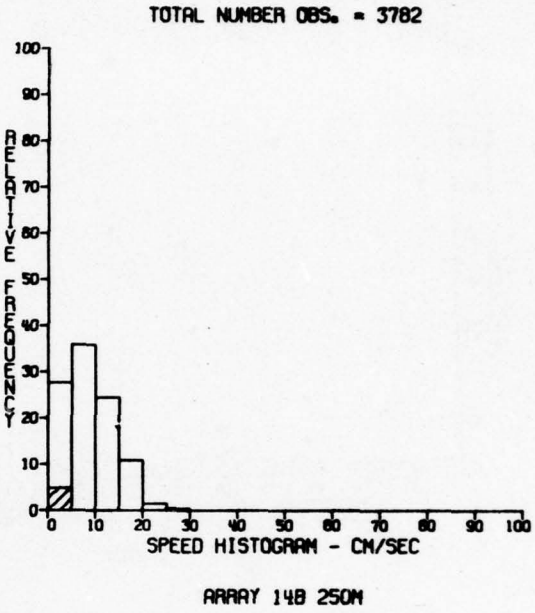
DIRECTION																		SUM	PER.CT.
0- 15	46	1				1												48	1.3
15- 30	54																	54	1.4
30- 45	45																	45	1.2
45- 60	58	1	2	1				1										63	1.7
60- 75	57	1		2														60	1.6
75- 90	84			1						1		1						87	2.3
90-105	116	1		1														118	3.1
105-120	85	1										1						87	2.3
120-135	108	2				1												111	3.0
135-150	183	2								1								186	5.0
150-165	153	2	1															156	4.2
165-180	128	2																130	3.5
180-195	79		1	1							1							82	2.2
195-210	83	3	1	1	1													89	2.4
210-225	144	5	1															150	4.0
225-240	217	2		2										1				222	5.9
240-255	301	4		1						1				1			2	310	8.3
255-270	387	12										1						400	10.7
270-285	384	7				1				2								394	10.5
285-300	287	3	2								1							293	7.8
300-315	259	4	1			1						1						266	7.1
315-330	220	3		1	1													225	6.0
330-345	110	4			1								1					116	3.1
345-360	55		1	1														57	1.5

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	3643	60	10	12	3	3	1	1	0	5	2	4	0	0	1	2	0	0	2	0		3749
PER.CT.	97.1	1.6	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.0		

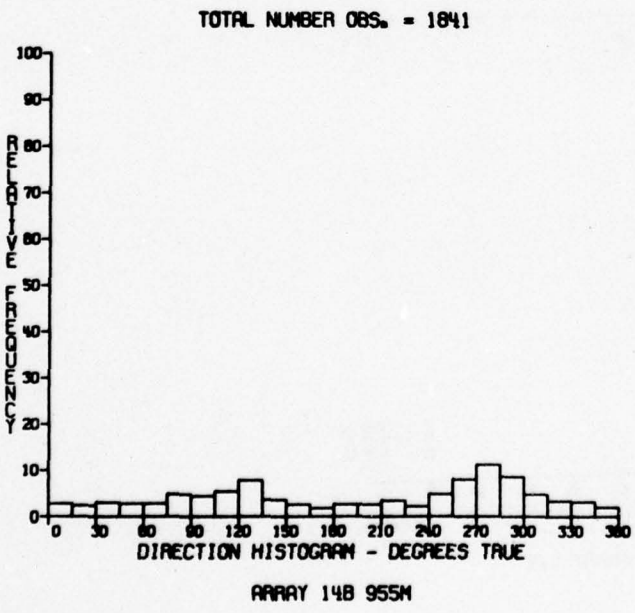
NUMBER OF ZERO SPEED AVERAGES = 1 PERCENTAGE ZERO SPEED AVERAGES = 0.0
TOTAL NUMBER OF OBS. = 3750


TOTAL NUMBER OBS. = 3601
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 148 250M

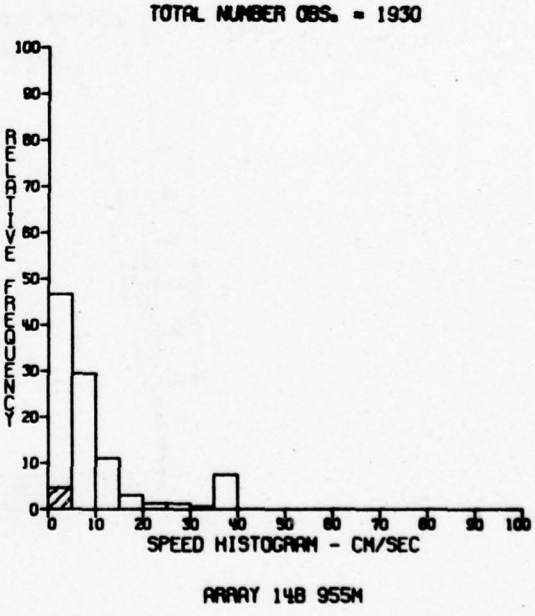
(a)


TOTAL NUMBER OBS. = 3782
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 148 250M

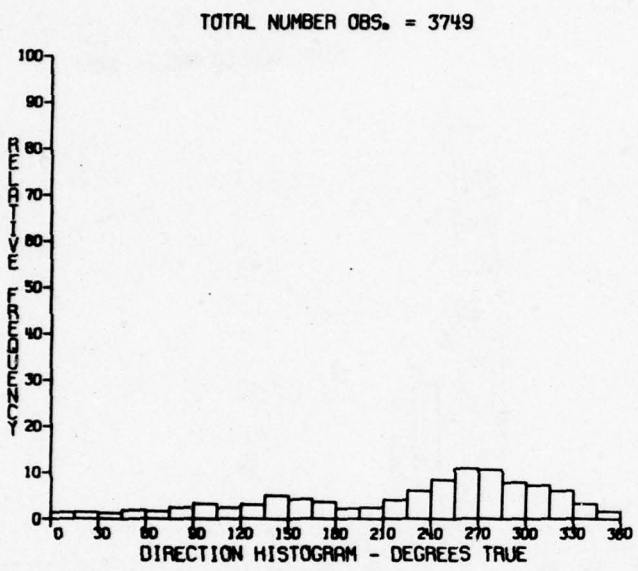
(b)


TOTAL NUMBER OBS. = 1841
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 148 955M

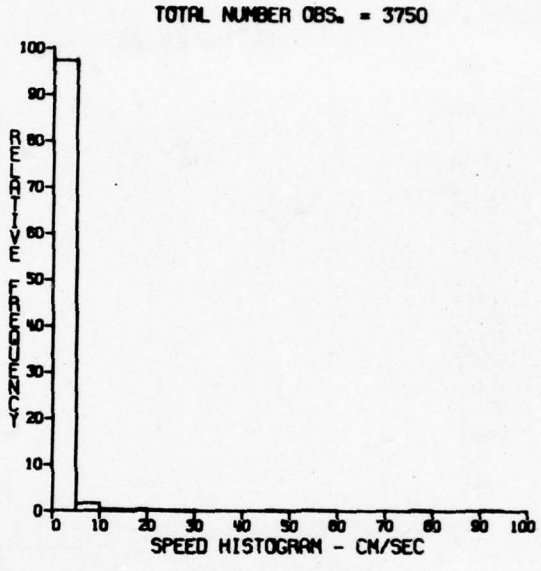
(c)


TOTAL NUMBER OBS. = 1930
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 148 955M

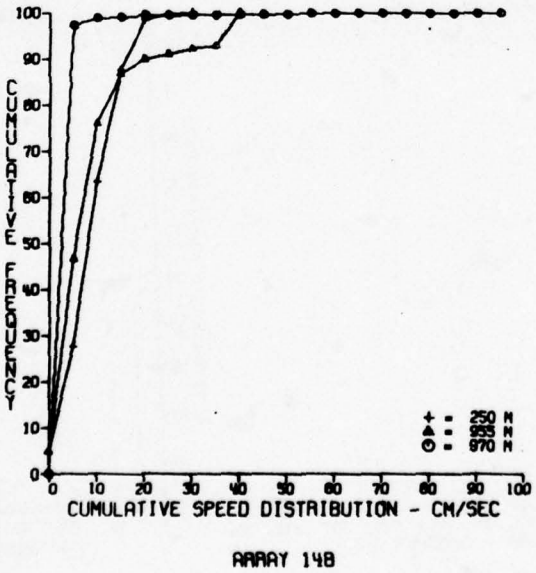
(d)


TOTAL NUMBER OBS. = 3749
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 148 970M

(a)

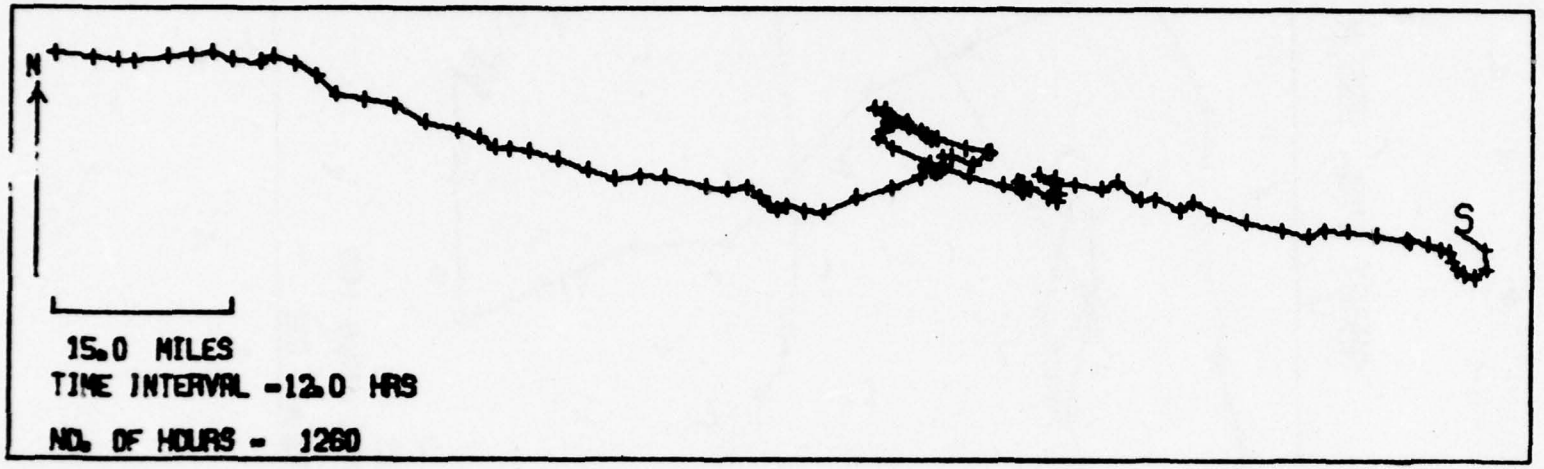

TOTAL NUMBER OBS. = 3750
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 148 970M

(b)

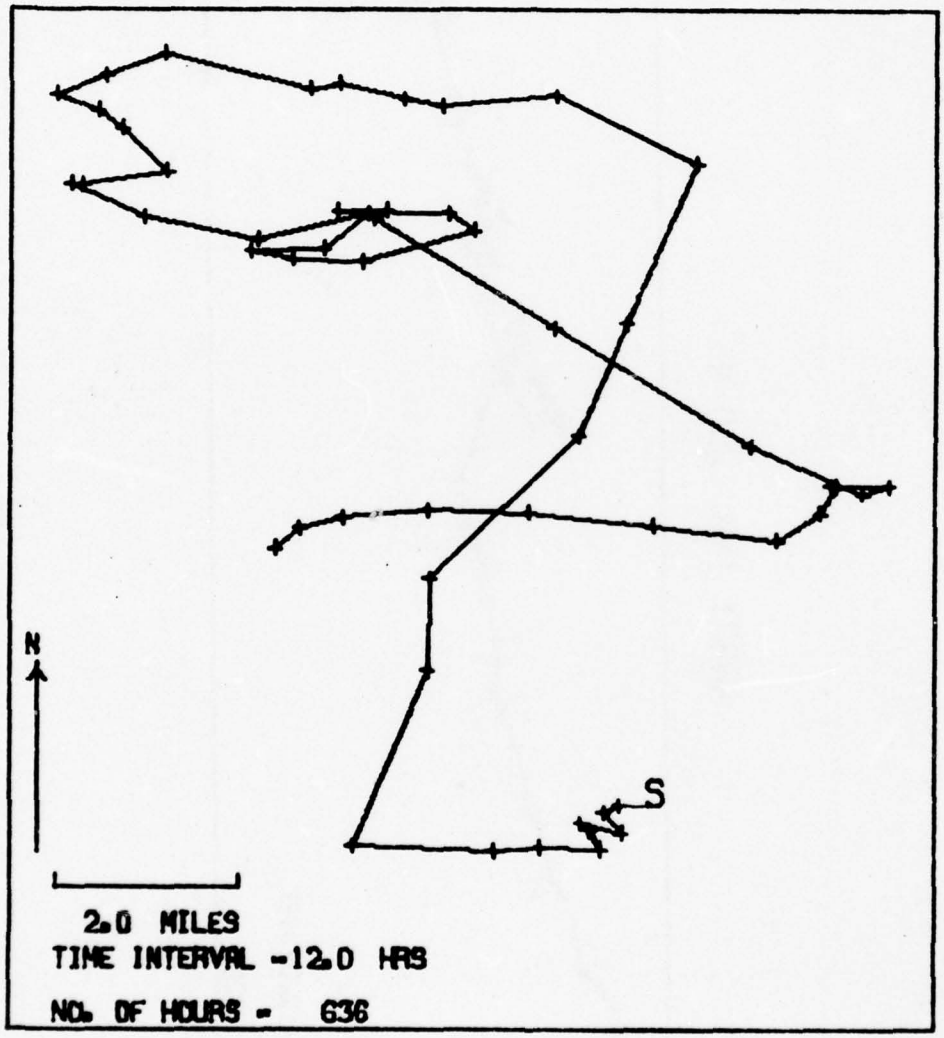

CUMULATIVE FREQUENCY
+ = 250 M
▲ = 955 M
⊙ = 970 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 148

(c)

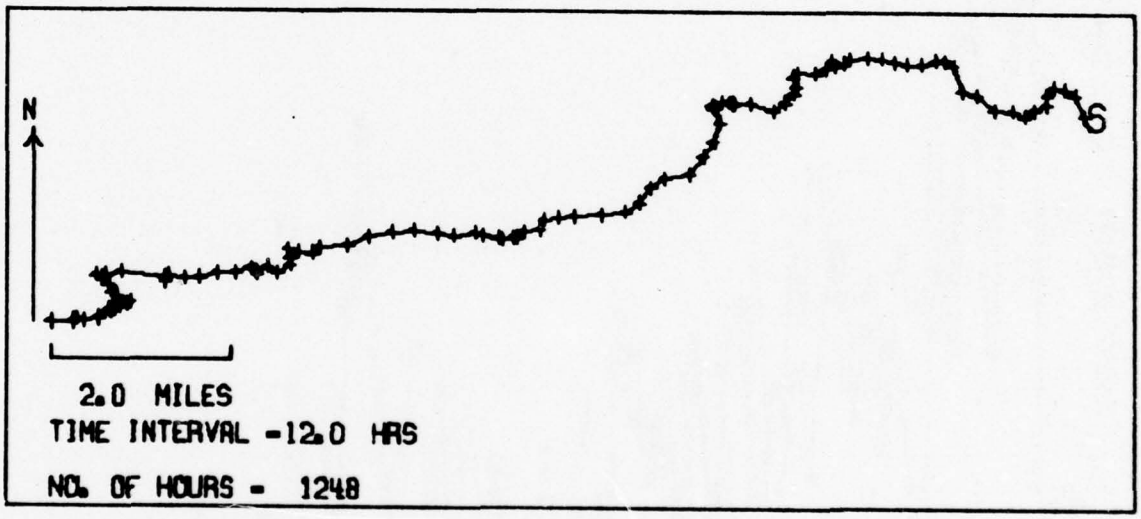
ARRAY 14B 250 M

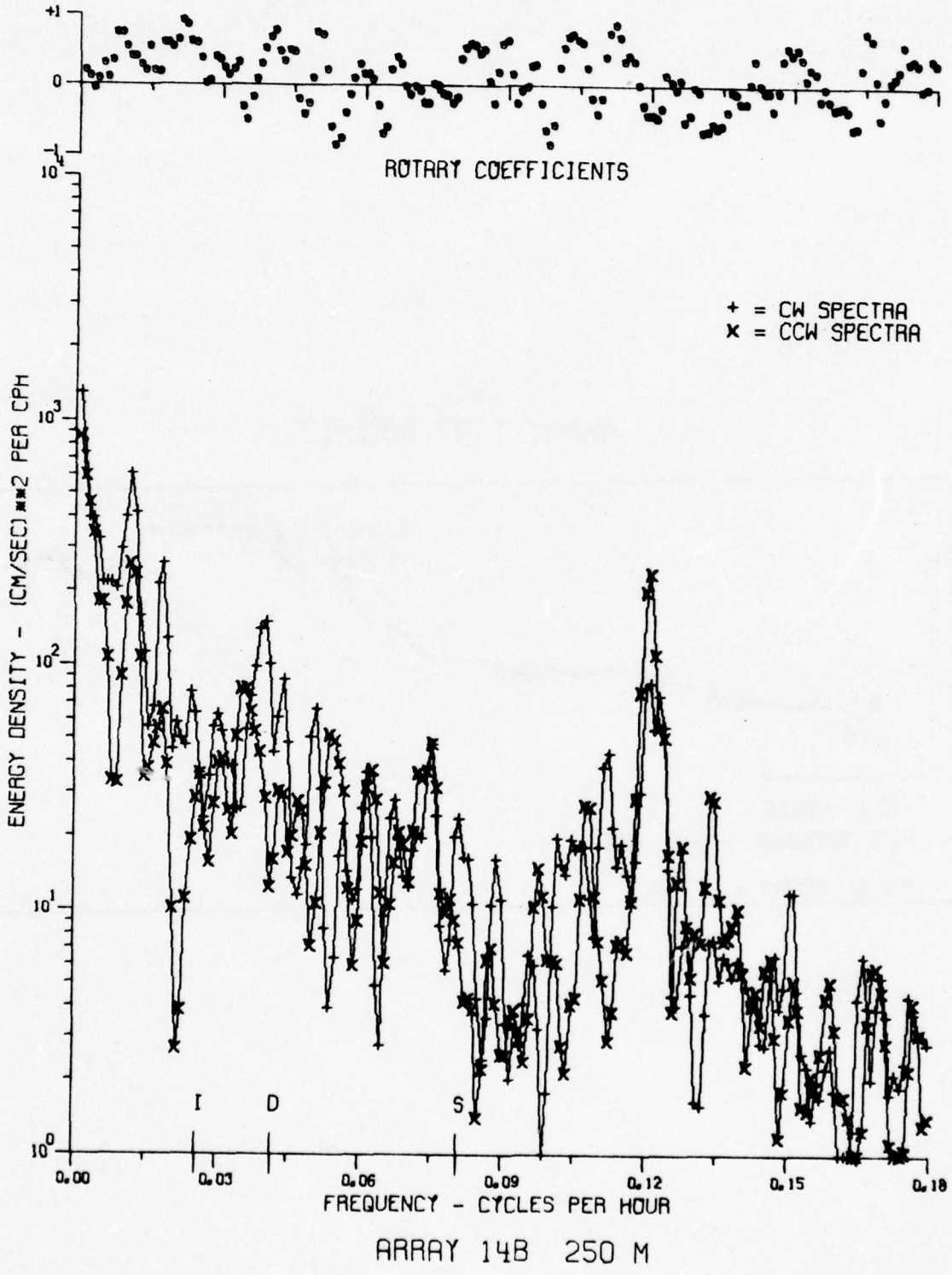


ARRAY 14B 955 M

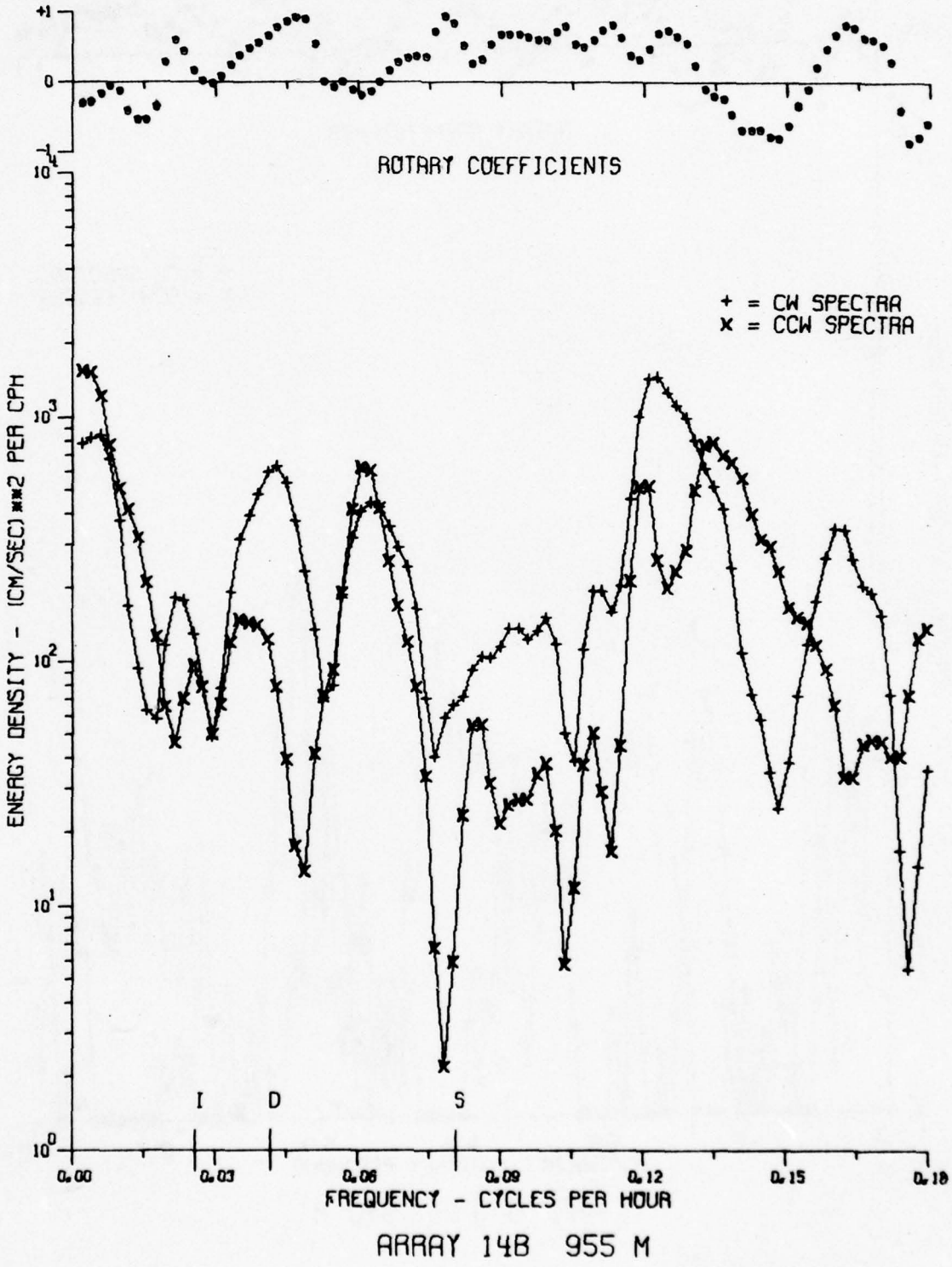


ARRAY 14B 970 M

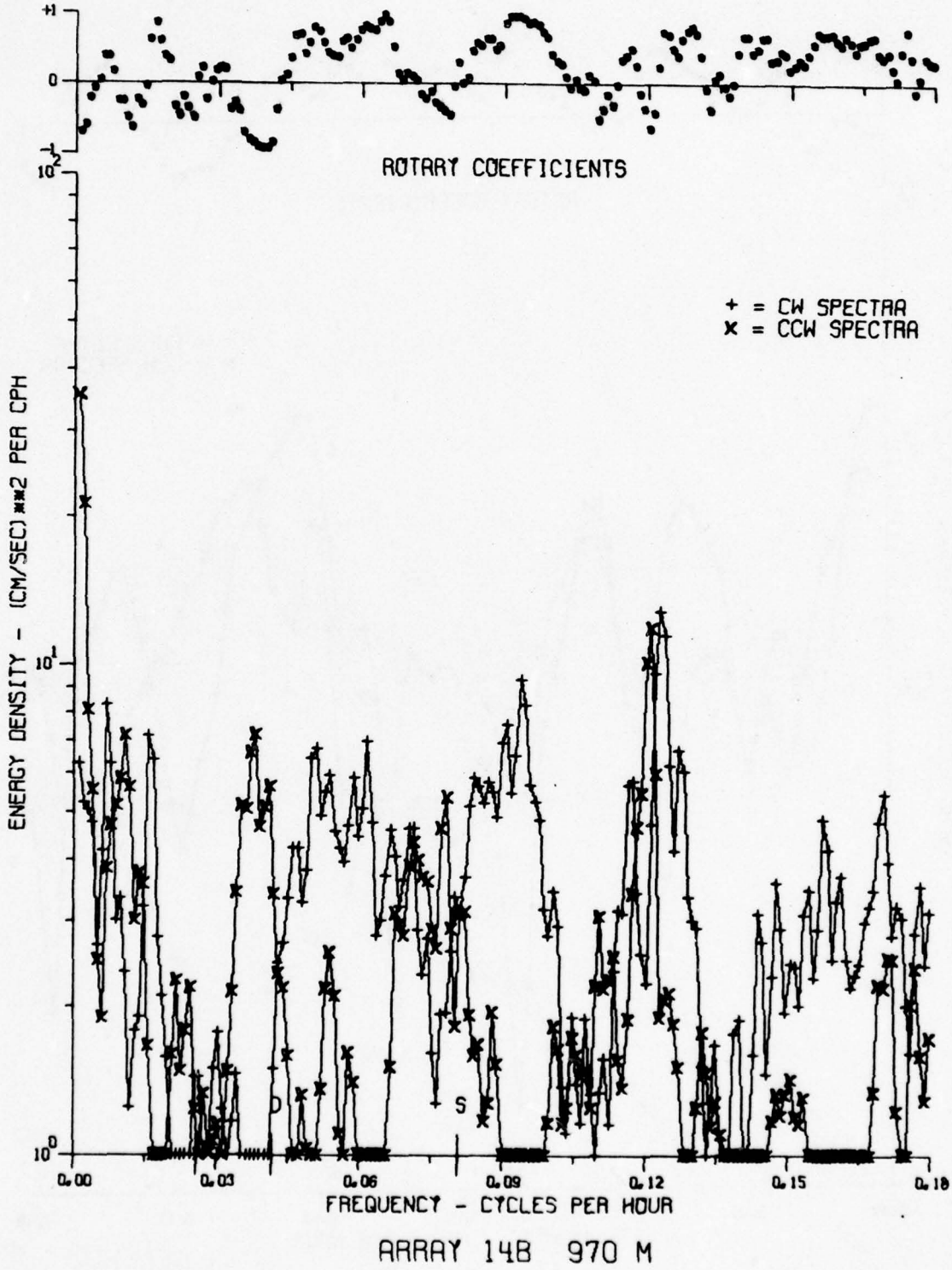




ARRAY 14B 250 M



ARRAY 14B 955 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^2
10^1
10^0
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 14B 970 M

ARRAY 15

CARIB 8RS 18 11 00N 67 41 07W FILM 896 START TIME 1300 09/29/72 WATER DEPTH =
485M SAMPLE DEPTH= 285M SAMPLE RATE 10MIN RECORD LENGTH = 682 HOURS

DIRECTION													SUM	PER.CT.
0- 15	8	20	46	47	30	31	21	5	2				210	5.1
15- 30	10	29	59	43	25	15	3						184	4.5
30- 45	14	27	41	39	16	4	2						143	3.5
45- 60	20	46	61	39	13	3	1						183	4.5
60- 75	15	46	66	43	2	3	2						177	4.3
75- 90	25	75	79	51	18	2							250	6.1
90-105	21	79	97	60	42	15	5	3					322	7.9
105-120	12	45	72	78	41	41	14	4	1				308	7.5
120-135	13	22	37	64	70	52	25	10	21	6	1		321	7.8
135-150	8	16	34	44	43	40	47	24	22	6	4	1	289	7.1
150-165	5	8	16	21	28	25	27	17	21	4	4	2 3	181	4.4
165-180	8	3	9	17	9	16	9	14	2				87	2.1
180-195	5	10	9	9	5	15	13	4					70	1.7
195-210	10	9	10	9	13	12	9						68	1.7
210-225	5	5	11	15	7	7	3	1					54	1.3
225-240	3	6	18	15	14	3							59	1.4
240-255	5	7	8	11	5	4							40	1.0
255-270	2	7	14	9	13	3							48	1.2
270-285	4	6	9	11	11	9	3						53	1.3
285-300	4	5	15	10	11	16	3	3	4				71	1.7
300-315	4	9	31	27	36	27	21	20	8				183	4.5
315-330	3	13	19	43	61	52	43	23	3				260	6.3
330-345	7	11	10	45	73	50	39	19					254	6.2
345-360	7	10	28	55	48	76	37	14	1				276	6.7

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	218	514	799	801	634	521	327	161	85	16	9	3	3	0	0	0	0	0	0	0	0	4091
PER.CT.	5.3	12.5	19.5	19.5	15.5	12.7	8.0	3.9	2.1	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

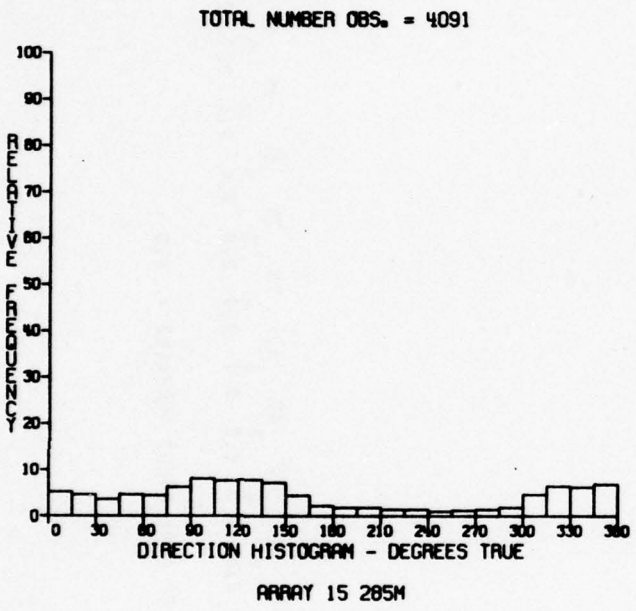
NUMBER OF ZERO SPEED AVERAGES = 7 PERCENTAGE ZERO SPEED AVERAGES = 0.2
TOTAL NUMBER OF OBS, = 4098

CARIB OPS 18 11 00N 65 41 07W FILM 897 START TIME 1300Z 09/29/72 WATER DEPTH =
485M SAMPLE DEPTH= 475M SAMPLE RATE 10MIN RECORD LENGTH= 58 HOURS

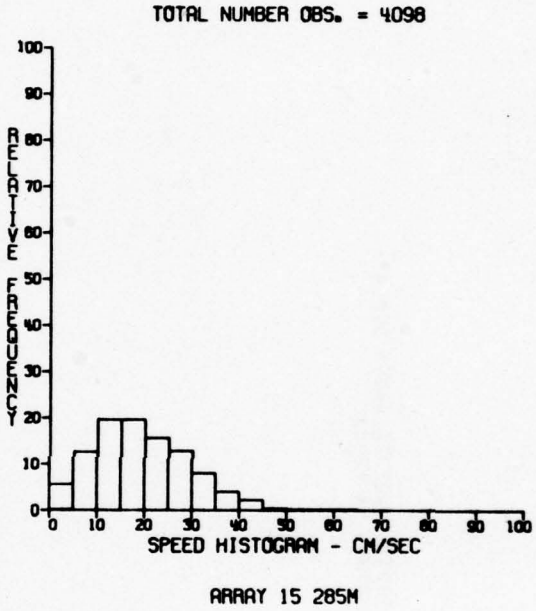
DIRECTION										SUM	PER.CT.
0- 15			5	1						6	1.7
15- 30		1	5		3	2				11	3.1
30- 45		2	8	7	5	6	2			30	8.6
45- 60			1	2	8	5	6	6	3	31	8.9
60- 75		2	9	8	5	8	8	5	2	48	13.7
75- 90		3	2			3				8	2.3
90-105		2			1					3	0.9
105-120				2	1					3	0.9
120-135		4	1							5	1.4
135-150		3		2						5	1.4
150-165		9	9	2						20	5.7
165-180		8	4	2						14	4.0
180-195		1		2	3	1				7	2.0
195-210			2	6	1	1	2	1		13	3.7
210-225		5	1	25	10	5	1			47	13.4
225-240		2	5	11	11	2				31	8.9
240-255		4	3	2	8	5	4	1		27	7.7
255-270		3	3	3	4	3	1			17	4.9
270-285		4	2	1	1					8	2.3
285-300				1						1	0.3
300-315										0	0.0
315-330										0	0.0
330-345										0	0.0
345-360										0	0.0

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM		53	62	76	60	41	24	13	5	1	0	0	0	0	0	0	0	0	0	0	0	335
PER.CT.	15.1	17.7	21.7	17.1	11.7	6.9	3.7	1.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

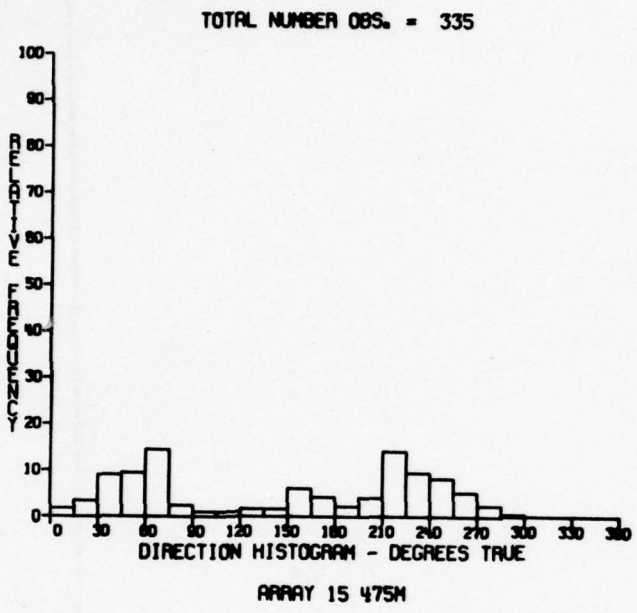
NUMBER OF ZERO SPEED AVERAGES = 15 PERCENTAGE ZERO SPEED AVERAGES = 4.3
TOTAL NUMBER OF OBS. = 350


TOTAL NUMBER OBS. = 4091
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 15 285M

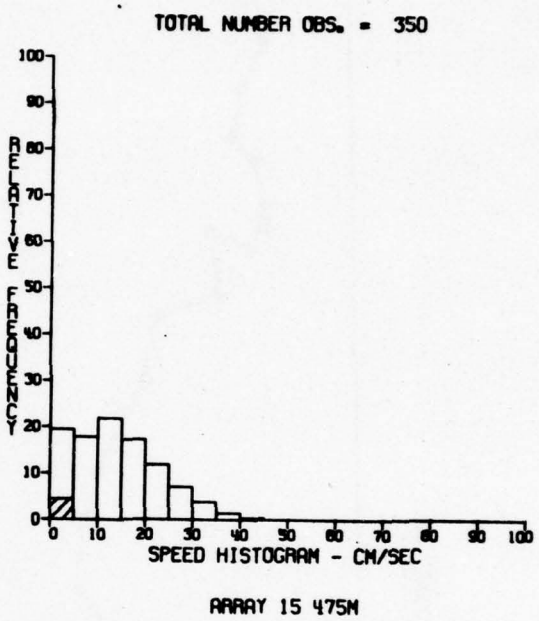
(a)


TOTAL NUMBER OBS. = 4098
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 15 285M

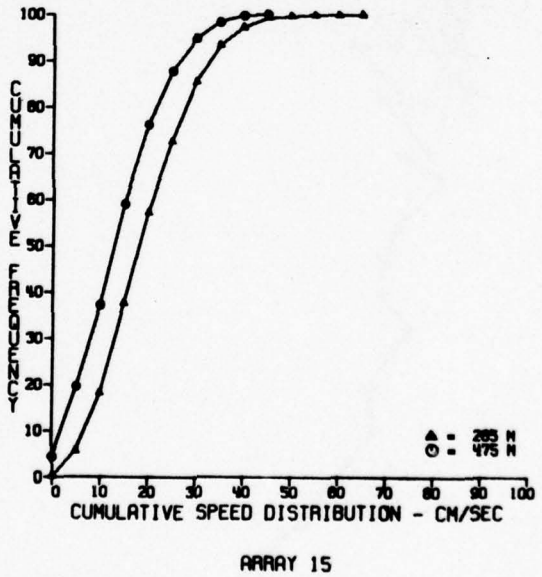
(b)


TOTAL NUMBER OBS. = 335
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 15 475M

(a)

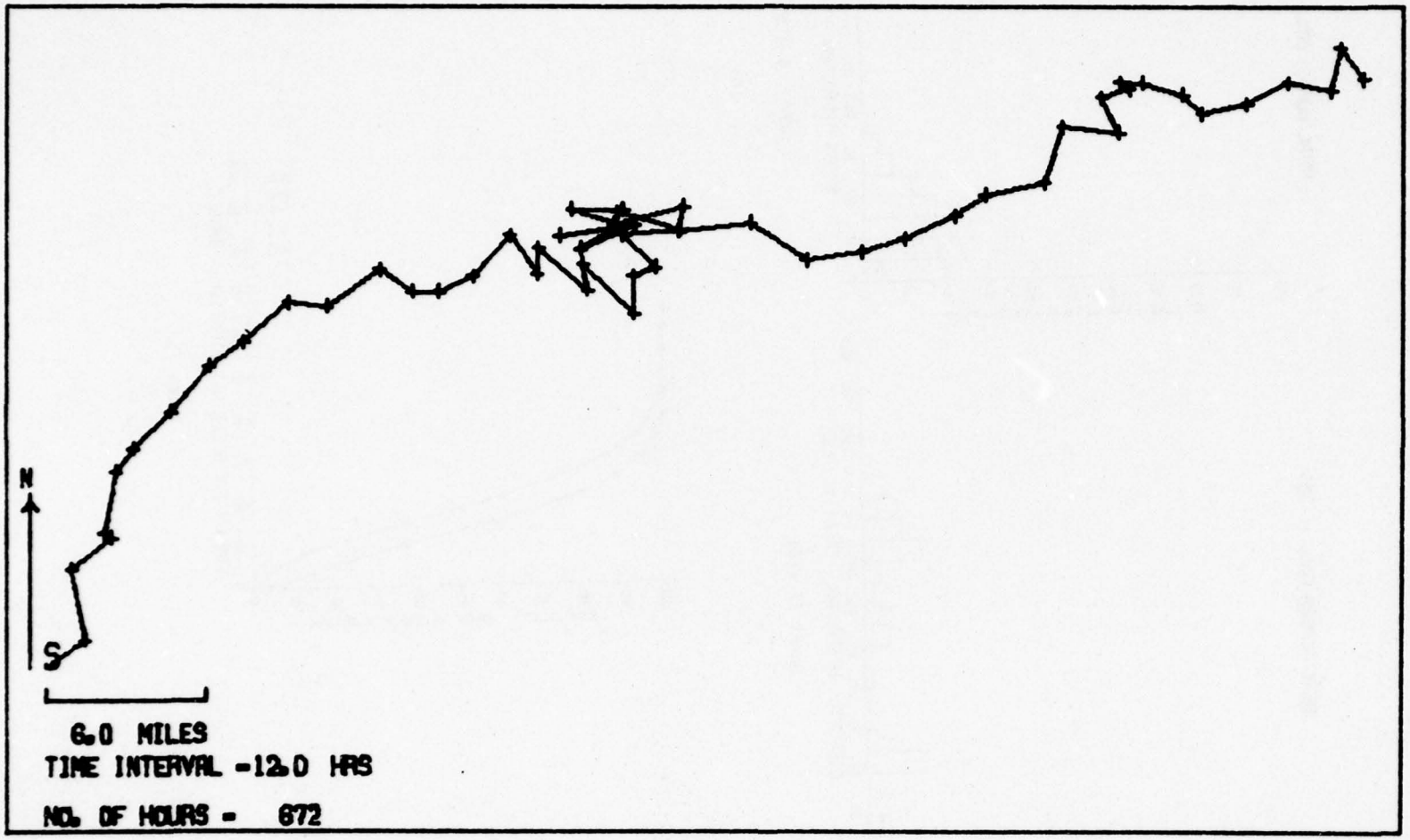

TOTAL NUMBER OBS. = 350
RELATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 15 475M

(b)

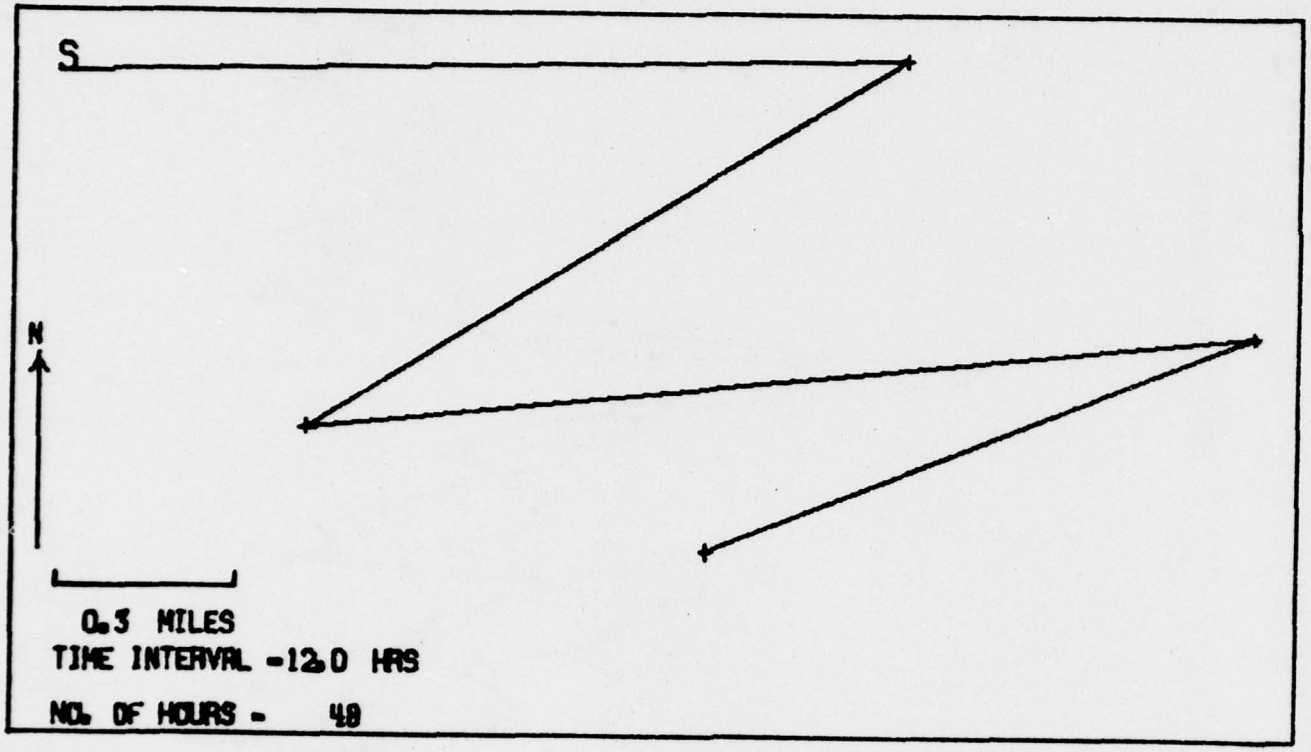

CUMULATIVE FREQUENCY
0 10 20 30 40 50 60 70 80 90 100
▲ = 285 M
⊙ = 475 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 15

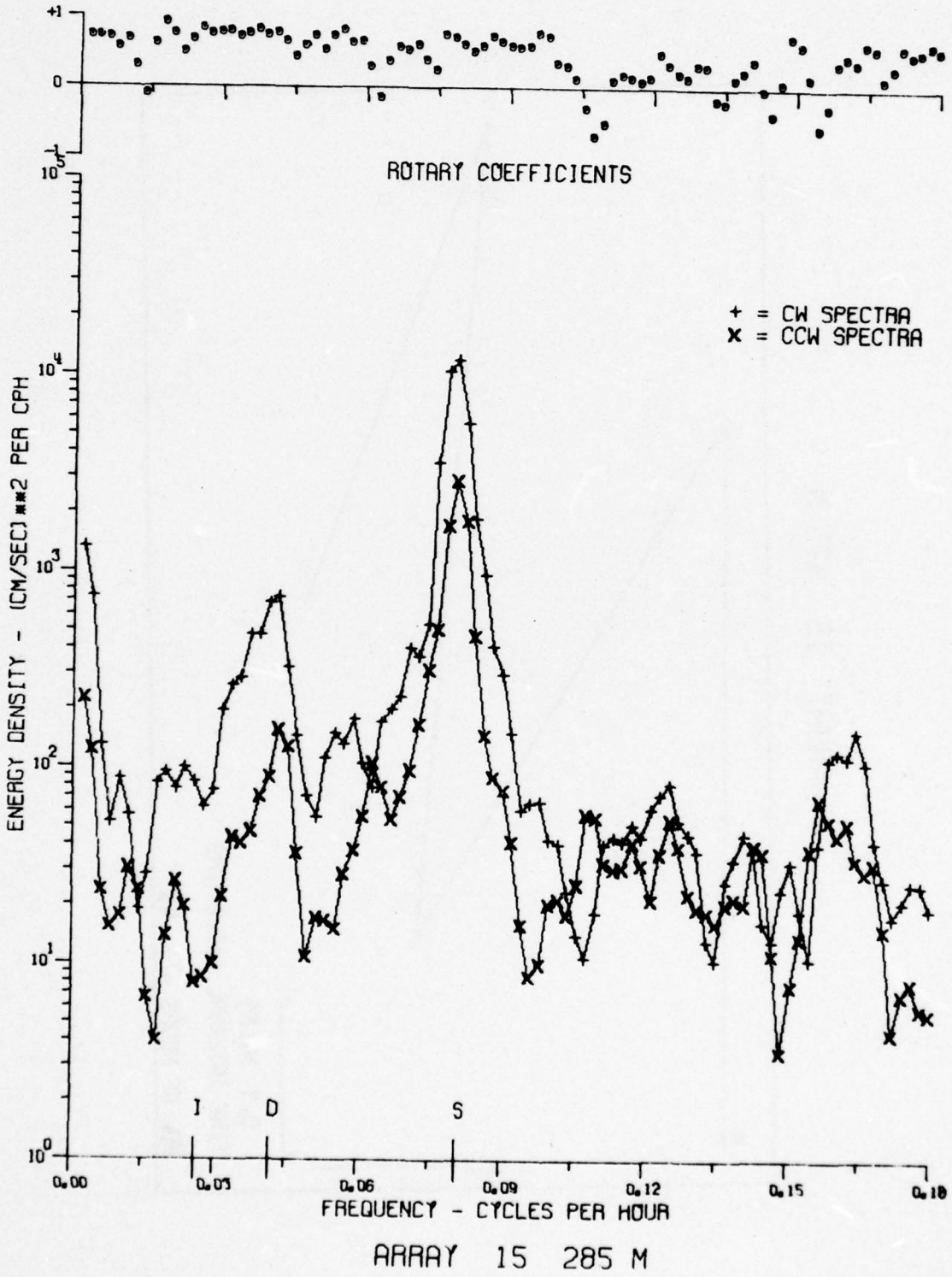
(c)

ARRAY 15 285 M



ARRAY 15 475 M





ARRAY 15 285 M

ARRAY 15 475 M

NO SPECT PLOT

SERIES TOO SHORT

ARRAY 15A

CARIB OPS 18 19 00N 68 0C 00W FILM 900 START TIME 2200Z 12/29/72 WATER DEPTH =
575M SAMPLE DEPTH= 56CM SAMPLE RATE 10MIN RECORD LENGTH= 666 HOURS

DIRECTION																					SUM	PER.CT.
0- 15	29	30	11	11	1	2	4	2													90	2.2
15- 30	19	37	36	21	12		3														128	3.2
30- 45	21	40	62	16	11	3	2						1								156	3.9
45- 60	21	61	68	41	8		1	1													201	5.0
60- 75	26	80	79	44	26	16	4														275	6.9
75- 90	20	79	100	80	52	25	5					1			1						363	9.1
90-105	25	45	57	46	43	16	10	1								1					244	6.1
105-120	25	34	36	18	12	8	4													1	138	3.4
120-135	18	21	15	17	4	2															77	1.9
135-150	11	15	7	3	1																37	0.9
150-165	11	11	2	4		2															30	0.7
165-180	14	19	10	8			2	2													55	1.4
180-195	14	18	11	1	2															1	47	1.2
195-210	9	18	13	7	1																48	1.2
210-225	11	24	20	1										1							57	1.4
225-240	22	27	20	10											1						80	2.0
240-255	15	55	53	43	25	23	9	6	1				1	1		2					234	5.8
255-270	23	73	79	91	61	79	55	32	6	5	3	1	1								509	12.7
270-285	29	86	109	79	63	35	29	11	12	5	6										464	11.6
285-300	26	73	78	64	40	13	12	1													307	7.7
300-315	18	27	24	9	8	2															88	2.2
315-330	21	31	16	3	5	1	1														78	1.9
330-345	25	24	6	4	3	2															64	1.6
345-360	31	23	6	3	2																65	1.6

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	484	951	918	624	380	229	141	56	19	10	9	2	3	2	2	3	0	0	0	2		3835
PER.CT.	12.1	23.8	22.9	15.6	9.5	5.7	3.5	1.4	0.5	0.2	0.2	0.0	0.1	0.0	0.0	0.1	0.0	0.0	0.0	0.0		

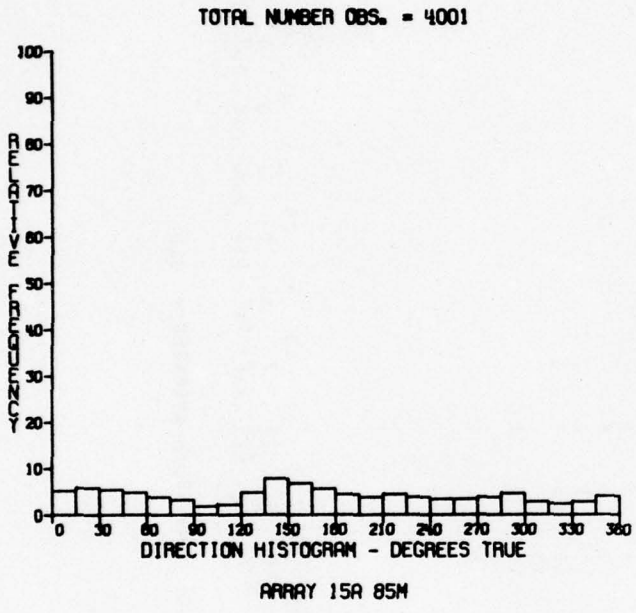
NUMBER OF ZERO SPEED AVERAGES = 167 PERCENTAGE ZERO SPEED AVERAGES = 4.2
TOTAL NUMBER OF OBS. = 4002

CARIB 8RS 18 19 00N 68 00 00W FILM 898 START TIME 2200Z 12/29/72 WATER DEPTH =
575M SAMPLE DEPTH= 85M SAMPLE RATE 10MIN RECORD LENGTH= 670 HOURS

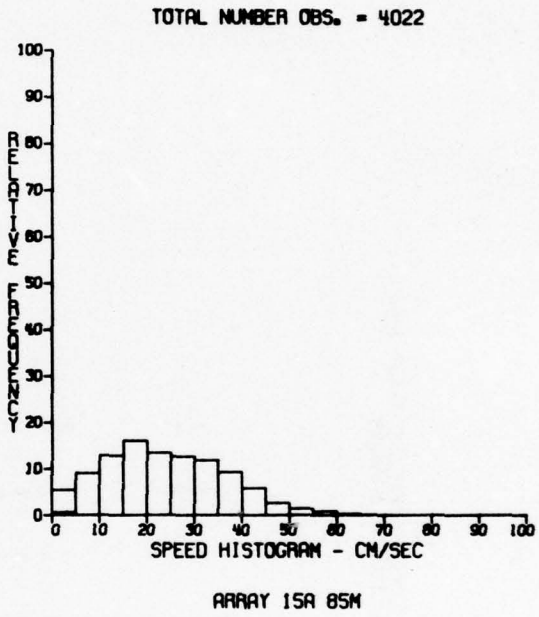
DIRECTION															SUM	PER.CT.
0- 15	5	20	27	33	29	32	23	18	14		2				203	5.0
15- 30	10	17	25	33	29	28	33	29	15	2	5	1			227	5.6
30- 45	7	14	26	30	29	28	31	17	24	6	4	1			217	5.4
45- 60	11	17	21	46	38	15	21	7	9	2	1				188	4.7
60- 75	6	14	35	36	28	12	10	10							151	3.8
75- 90	10	11	19	35	15	16	13	4	2						125	3.1
90-105	4	8	8	19	13	5	7	4	1						69	1.7
105-120	5	11	16	11	13	9	7	3		3	4	2	1		85	2.1
120-135	13	17	21	34	17	23	18	19	5	10	6	5	1		189	4.7
135-150	14	19	33	44	46	48	41	34	19	8	6			1	313	7.8
150-165	6	23	31	43	30	49	36	31	19	3	1				272	6.8
165-180	10	17	11	33	40	26	30	21	15	8	3	8	1		223	5.5
180-195	11	10	20	26	21	24	23	17	6	9	6	5			178	4.4
195-210	4	14	20	11	17	31	23	12	7	7	3	2	3		154	3.8
210-225	6	15	14	14	21	25	23	16	14	15	11	2	1		177	4.4
225-240	5	15	11	16	20	20	17	15	18	15					152	3.8
240-255	4	10	13	19	16	8	15	19	9	11	4	3			131	3.3
255-270	7	11	17	18	16	13	16	17	14	4					133	3.3
270-285	9	17	16	20	21	16	13	19	21	2					154	3.8
285-300	5	28	26	34	31	19	21	15	7						186	4.6
300-315	13	8	25	23	6	12	10	9	1						107	2.7
315-330	8	8	21	15	9	8	11	8	4						92	2.3
330-345	10	16	23	26	9	6	8	9	7						114	2.8
345-360	8	17	31	20	22	30	19	12	2						161	4.0

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	191	357	510	639	536	503	469	365	233	105	56	29	7	1	0	0	0	0	0	0	0	4001
PER.CT.	4.7	8.9	12.7	15.9	13.3	12.5	11.7	9.1	5.8	2.6	1.4	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

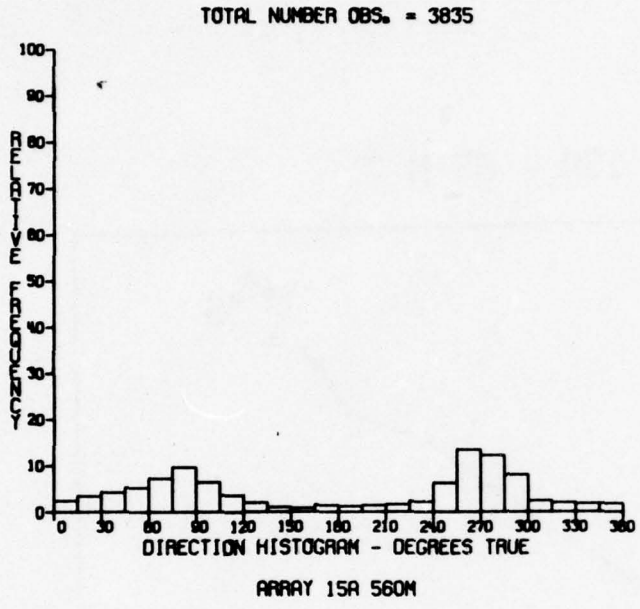
NUMBER OF ZERO SPEED AVERAGES = 21 PERCENTAGE ZERO SPEED AVERAGES = 0.5
TOTAL NUMBER OF OBS. = 4022


TOTAL NUMBER OBS. = 4001
RELATIVE FREQUENCY (PERCENT)
0
10
20
30
40
50
60
70
80
90
100
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 15A 85M

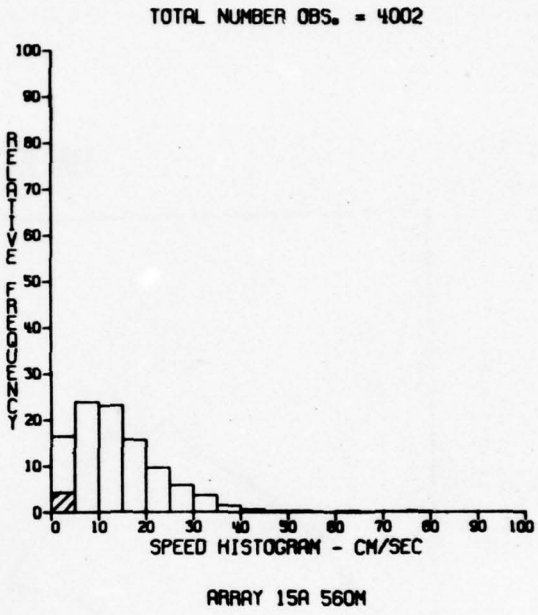
(a)


TOTAL NUMBER OBS. = 4022
RELATIVE FREQUENCY (PERCENT)
0
10
20
30
40
50
60
70
80
90
100
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 15A 85M

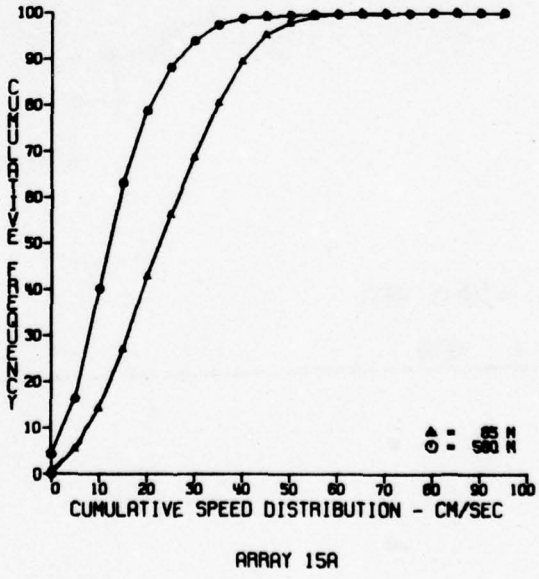
(b)


TOTAL NUMBER OBS. = 3835
RELATIVE FREQUENCY (%)
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 15A 560M

(a)

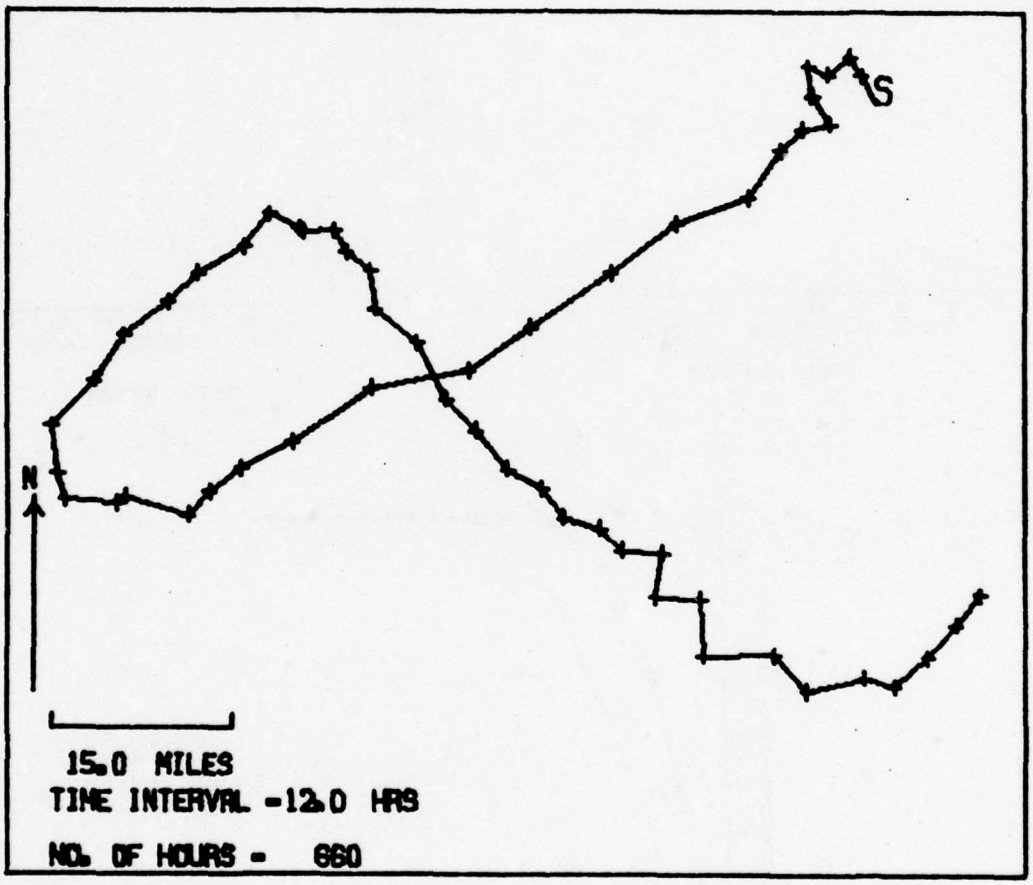

TOTAL NUMBER OBS. = 4002
RELATIVE FREQUENCY (%)
SPEED HISTOGRAM - CM/SEC
ARRAY 15A 560M

(b)

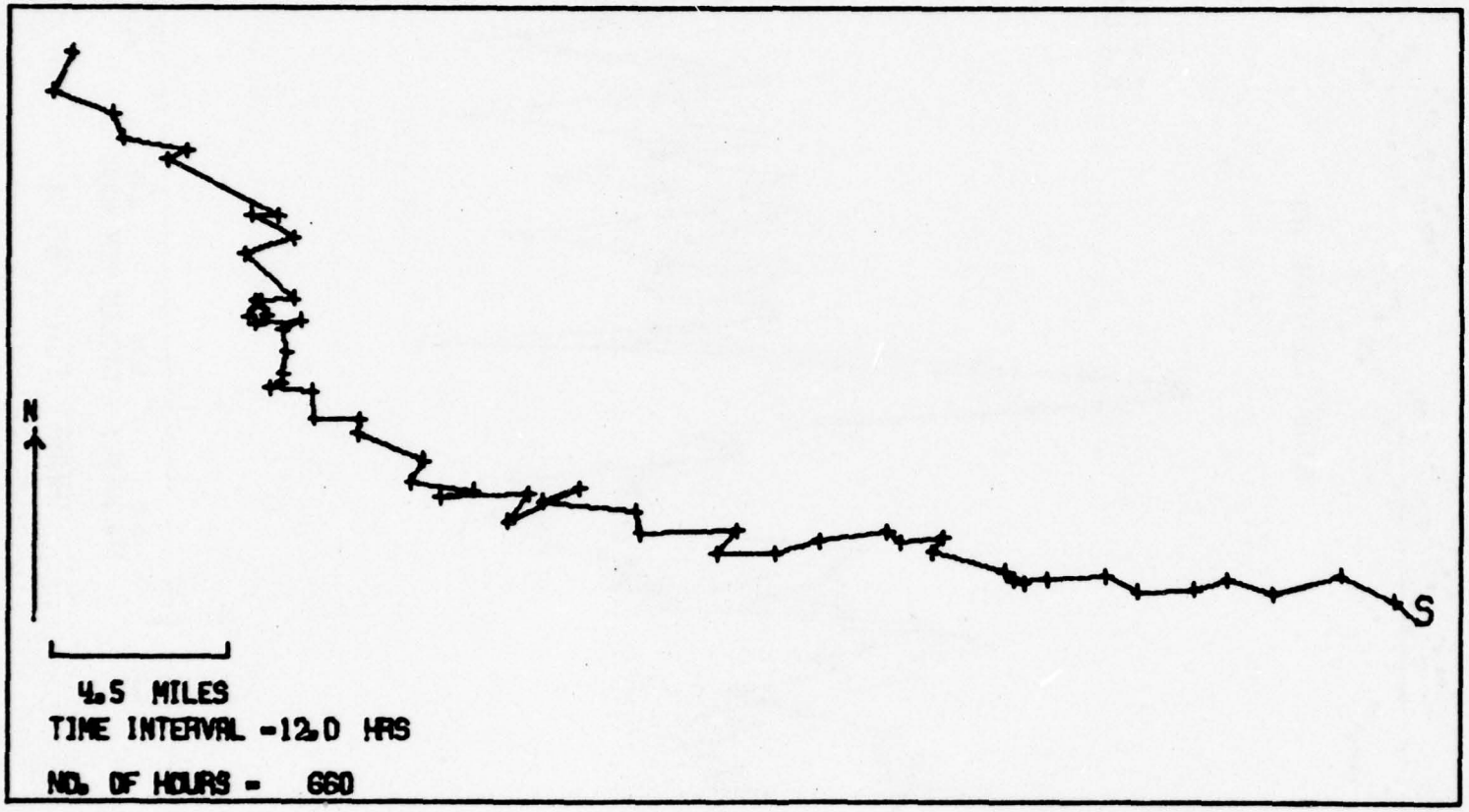

CUMULATIVE FREQUENCY (%)
▲ = 65 M
○ = 560 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 15A

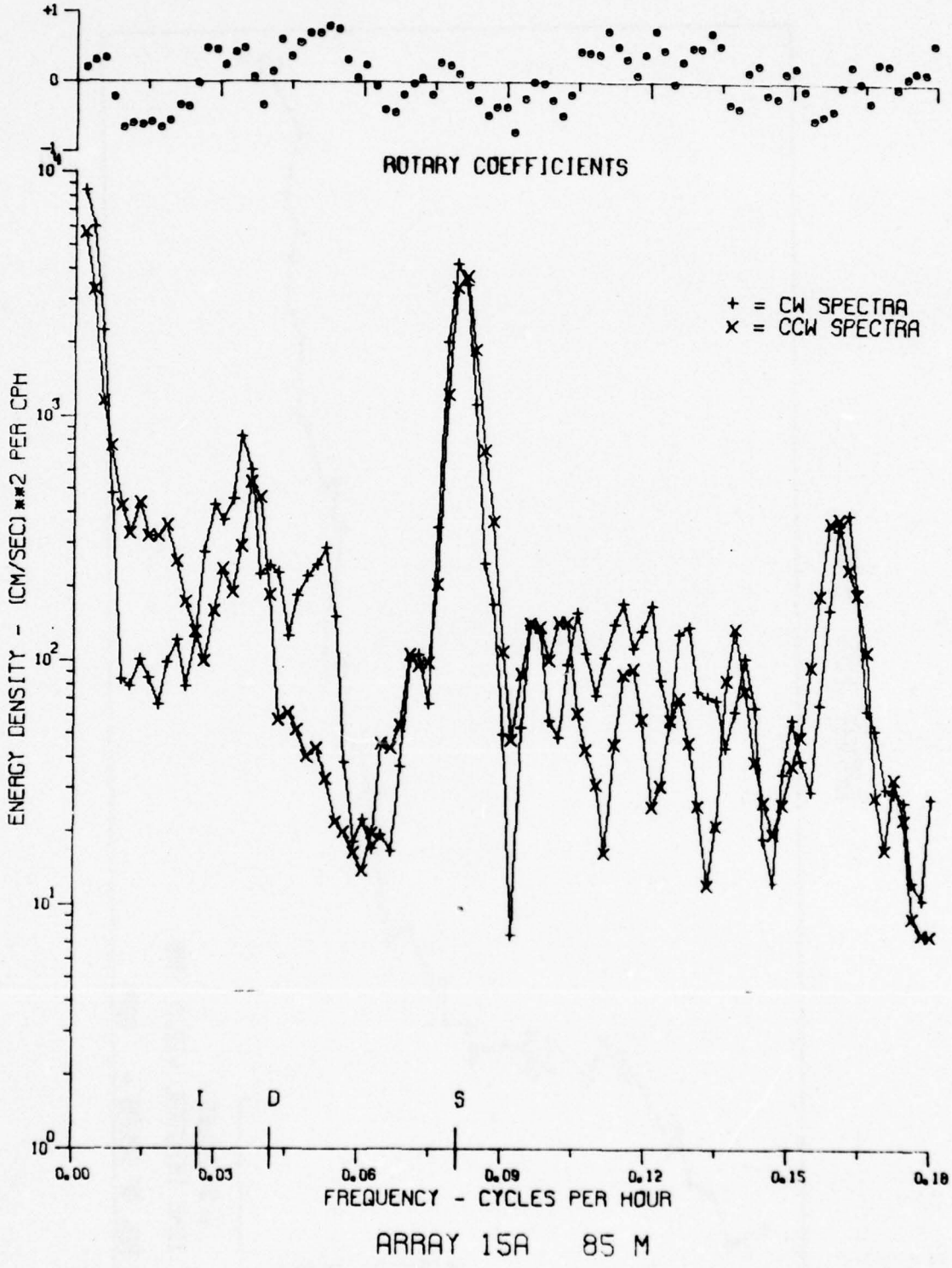
(c)

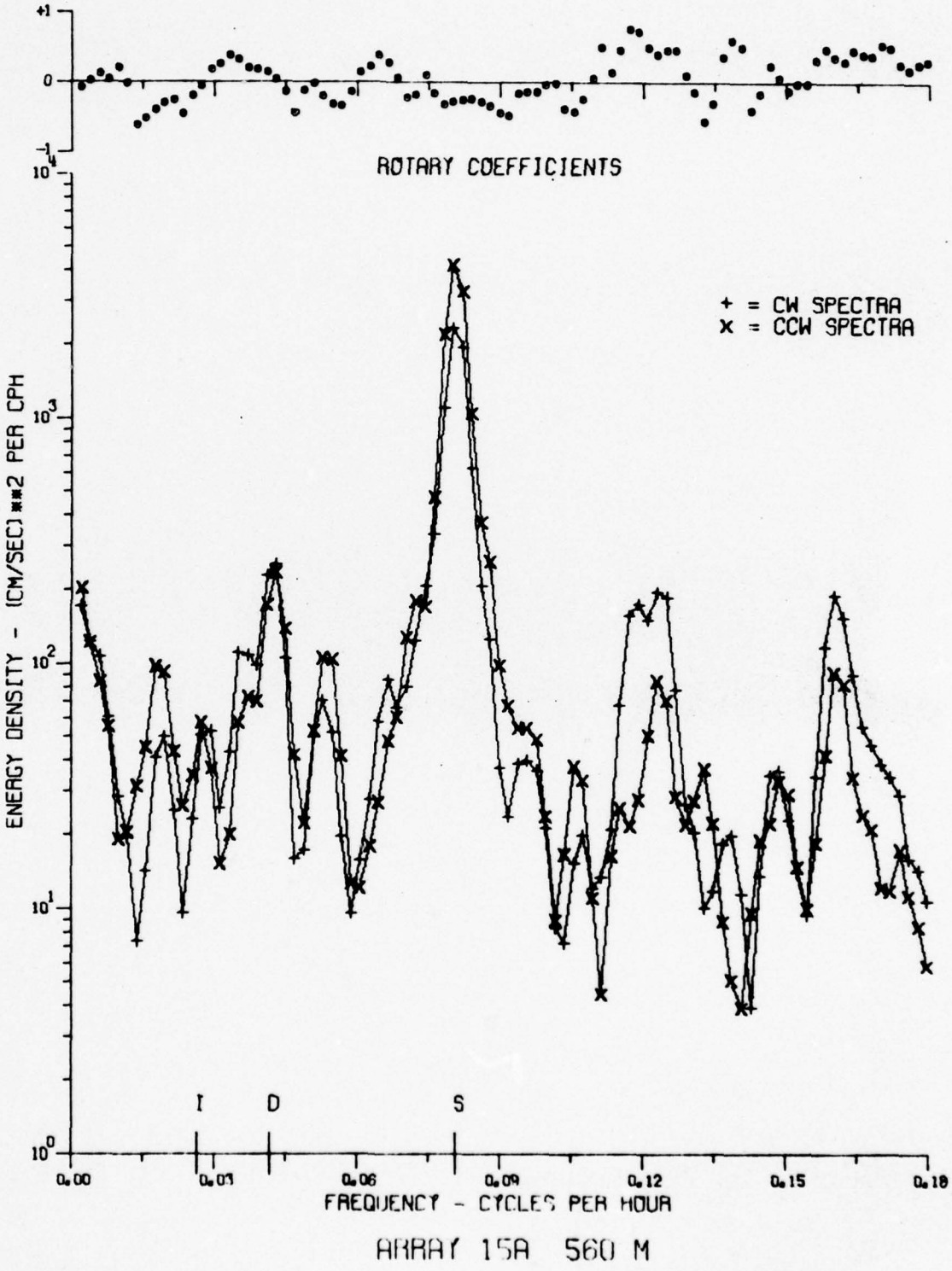
ARRAY 15A 85 M



ARRAY 15A 560 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 15A 85 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
x = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^4
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 15A 560 M

ARRAY 15B

CARIB OPS 18 31 06N 67 48 02W FILM 901 START TIME 1700Z 09/28/72 WATER DEPTH =
625M SAMPLE DEPTH= 350M SAMPLE RATE 10MIN RECORD LENGTH= 666 HOURS

DIRECTION											SUM	PER.CT.
0- 15	61	88	42	30	13	9	11	8	2	1	265	6.6
15- 30	65	86	50	24	21	18	11	16	8	1	300	7.5
30- 45	47	71	31	20	20	21	12	10	1		233	5.8
45- 60	42	50	22	15	11	9	8	1			158	3.9
60- 75	40	58	32	20	3		6				159	4.0
75- 90	31	53	21	6							111	2.8
90-105	31	34	18	5							88	2.2
105-120	28	41	19	2	2						92	2.3
120-135	21	41	21	4	4						91	2.3
135-150	16	34	7								57	1.4
150-165	33	49	9	3							94	2.3
165-180	23	37	2	1							63	1.6
180-195	26	36	14								76	1.9
195-210	24	35	16	4	1						80	2.0
210-225	33	47	37	18	1						136	3.4
225-240	31	76	57	9	1						174	4.3
240-255	35	80	42	19	1						177	4.4
255-270	50	76	46	5	5	1					183	4.6
270-285	42	115	36	7	3	1					204	5.1
285-300	43	110	64	15	9	6					247	6.2
300-315	97	96	30	18	6	5					212	5.3
315-330	74	107	34	3	1	1					220	5.5
330-345	63	83	20	3	5	6					180	4.5
345-360	72	81	29	8	5	8	4				207	5.2

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	988	1584	699	239	112	85	52	35	11	2	0	0	0	0	0	0	0	0	0	0	0	3807
PER.CT.	24.7	39.6	17.5	6.0	2.8	2.1	1.3	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

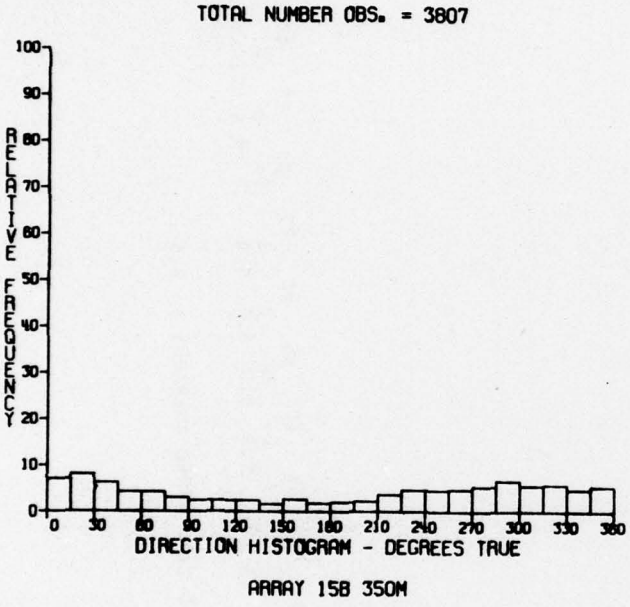
NUMBER OF ZERO SPEED AVERAGES = 195 PERCENTAGE ZERO SPEED AVERAGES = 4.9
TOTAL NUMBER OF OBS. = 4002

CARIB OPS 18 31 06N 67 48 02W FILM 902 START TIME 17002 09/28/72 WATER DEPTH =
6254 SAMPLE DEPTH= 61?M SAMPLE RATE 10MIN RECORD LENGTH= 665 HOURS

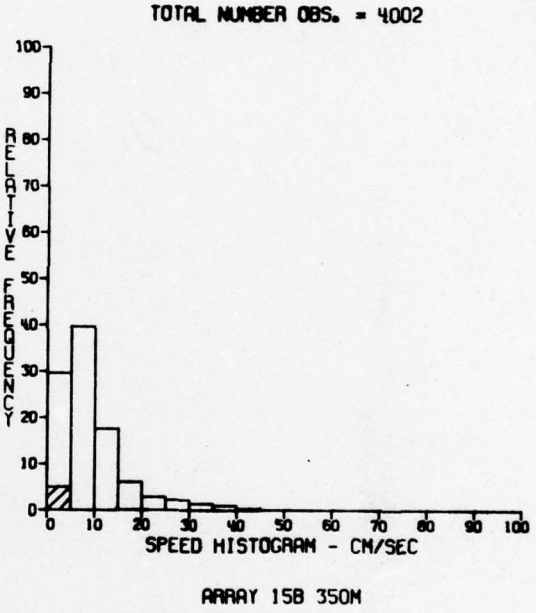
DIRECTION											SUM	PER.CT.
0- 15	25	37	28	11	1	4	7	4	5		122	3.1
15- 30	21	50	44	15	12	4	1				147	3.7
30- 45	9	22	36	57	50	22	8	3	1		208	5.2
45- 60	15	39	53	72	86	71	27	16	5	2	386	9.7
60- 75	15	38	45	87	83	62	26	14	4		374	9.4
75- 90	21	68	59	81	62	40	5	6	4	3	349	8.7
90-105	18	50	74	54	19	23	1	1			240	6.0
105-120	21	24	28	15	6						94	2.4
120-135	10	25	15	6							56	1.4
135-150	7	33	21	3							64	1.6
150-165	15	19	40	12							86	2.2
165-180	10	26	23	13	3	1					76	1.9
180-195	16	49	18	14	6	1	1				105	2.6
195-210	20	26	29	20	5	1					101	2.5
210-225	25	27	27	21	21	8	1				130	3.3
225-240	12	29	32	34	29	11	10	3			160	4.0
240-255	20	38	42	27	17	12	15	6			177	4.4
255-270	19	96	63	51	19	21	6	1			276	6.9
270-285	50	75	63	51	26	10	2				277	6.9
285-300	38	43	43	24	5						153	3.8
300-315	20	38	18	5	1						82	2.1
315-330	19	42	10								71	1.8
330-345	34	42	6								82	2.1
345-360	33	30	9	3	1						76	1.9

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	493	966	826	676	452	291	110	54	19	5	0	0	0	0	0	0	0	0	0	0	0	3892
PER.CT.	12.3	24.2	20.7	16.9	11.3	7.3	2.8	1.4	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

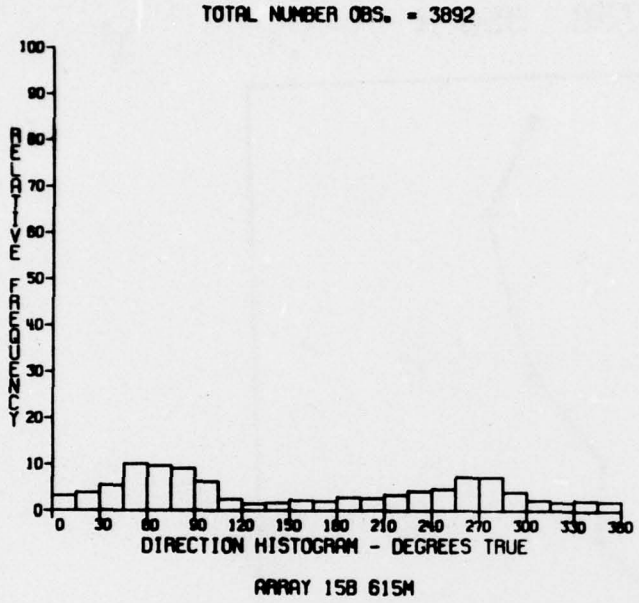
NUMBER OF ZERO SPEED AVERAGES = 102 PERCENTAGE ZERO SPEED AVERAGES = 2.6
TOTAL NUMBER OF OBS. = 3994


TOTAL NUMBER OBS. = 3807
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 30 60 90 120 150 180 210 240 270 300 330 360
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 15B 350M

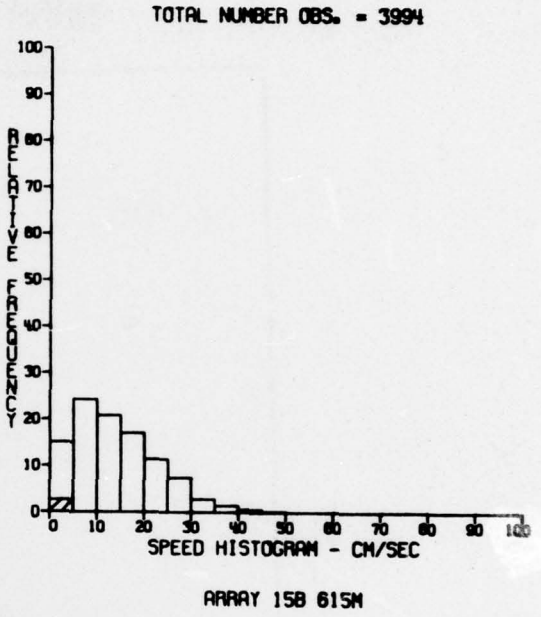
(a)


TOTAL NUMBER OBS. = 4002
RELATIVE FREQUENCY
100
90
80
70
60
50
40
30
20
10
0
0 10 20 30 40 50 60 70 80 90 100
SPEED HISTOGRAM - CM/SEC
ARRAY 15B 350M

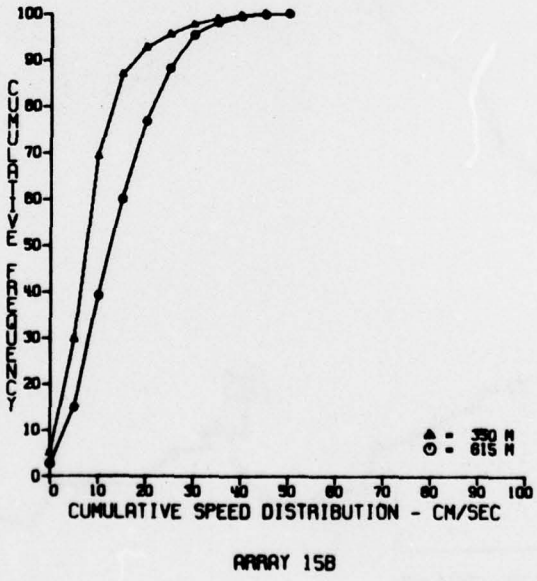
(b)


TOTAL NUMBER OBS. = 3892
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 158 615M

(a)

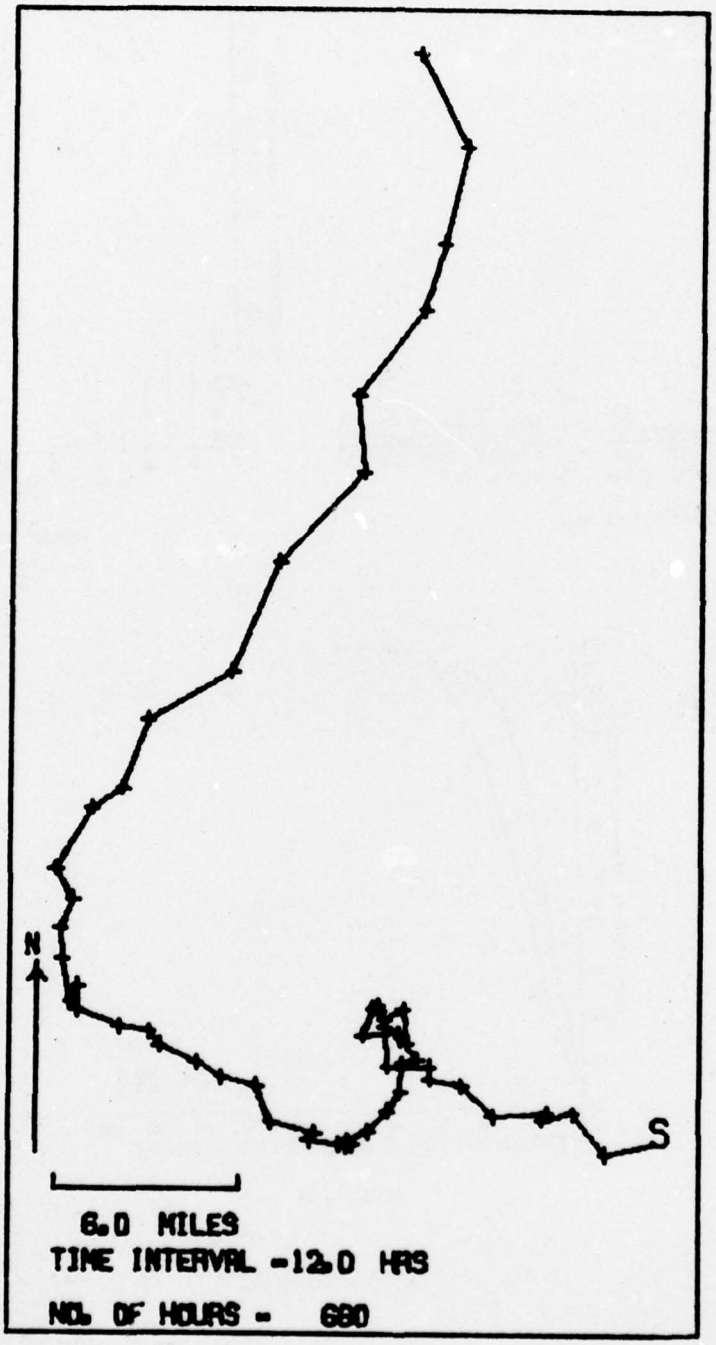

TOTAL NUMBER OBS. = 3994
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 158 615M

(b)

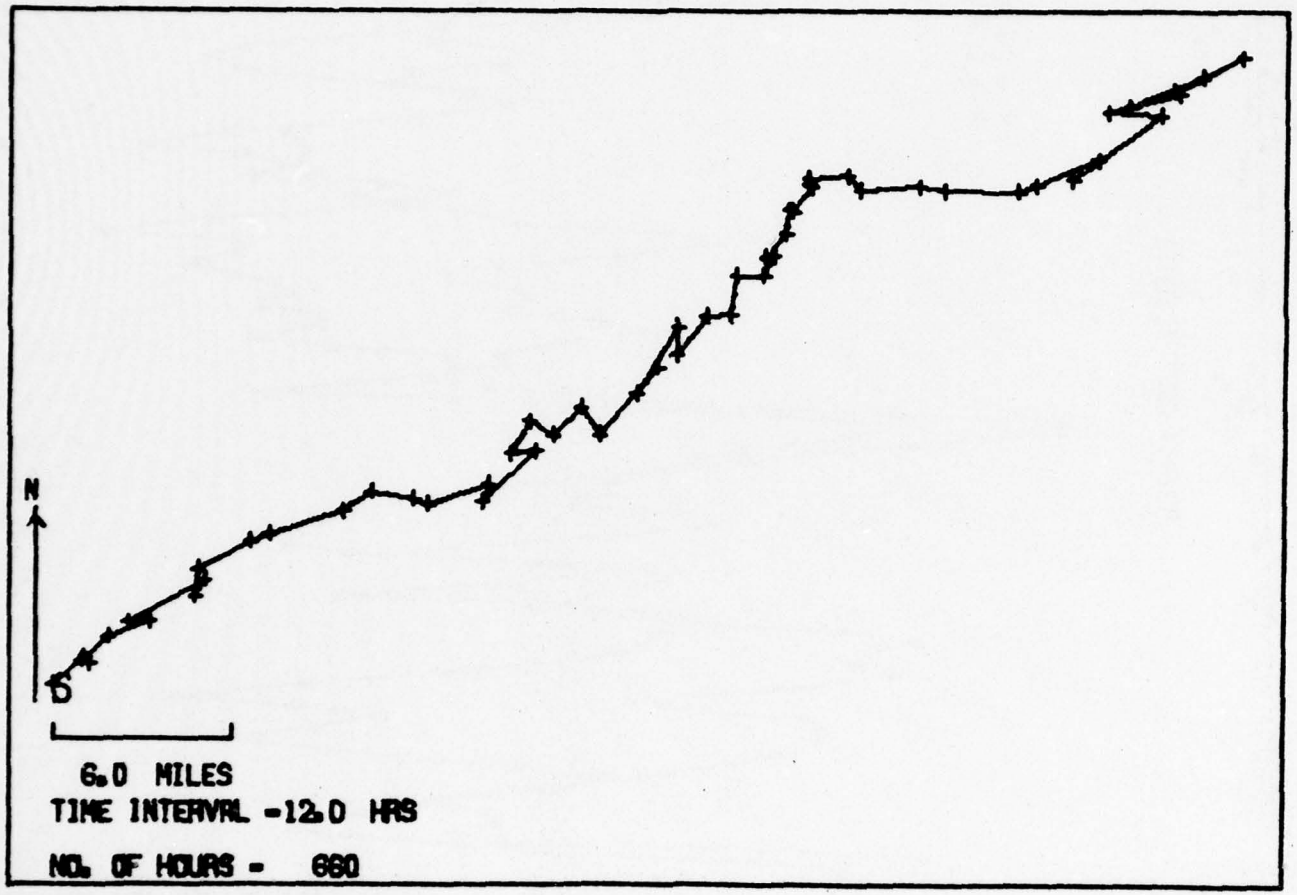

CUMULATIVE FREQUENCY
▲ = 350 M
⊙ = 615 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 158

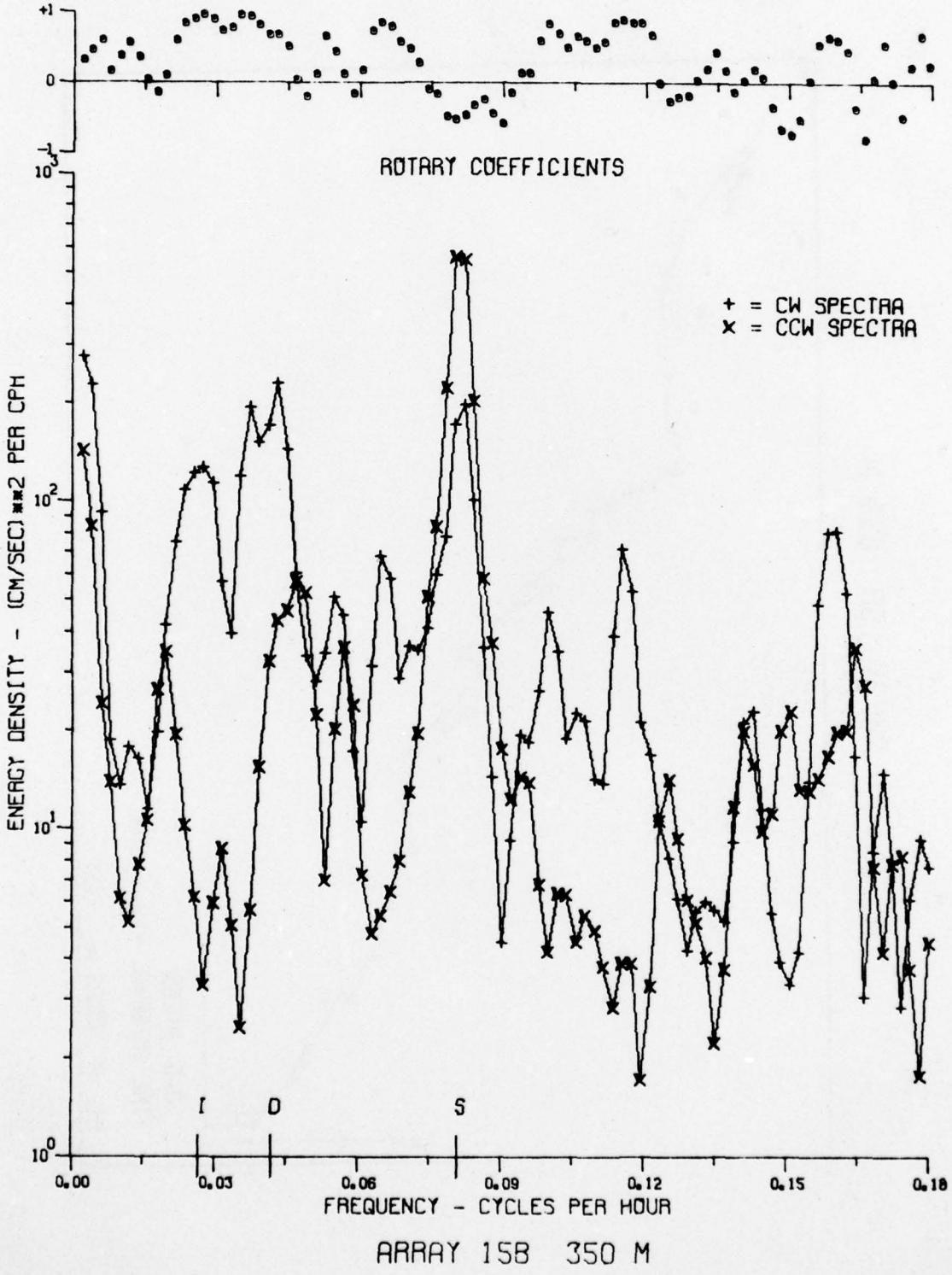
(c)

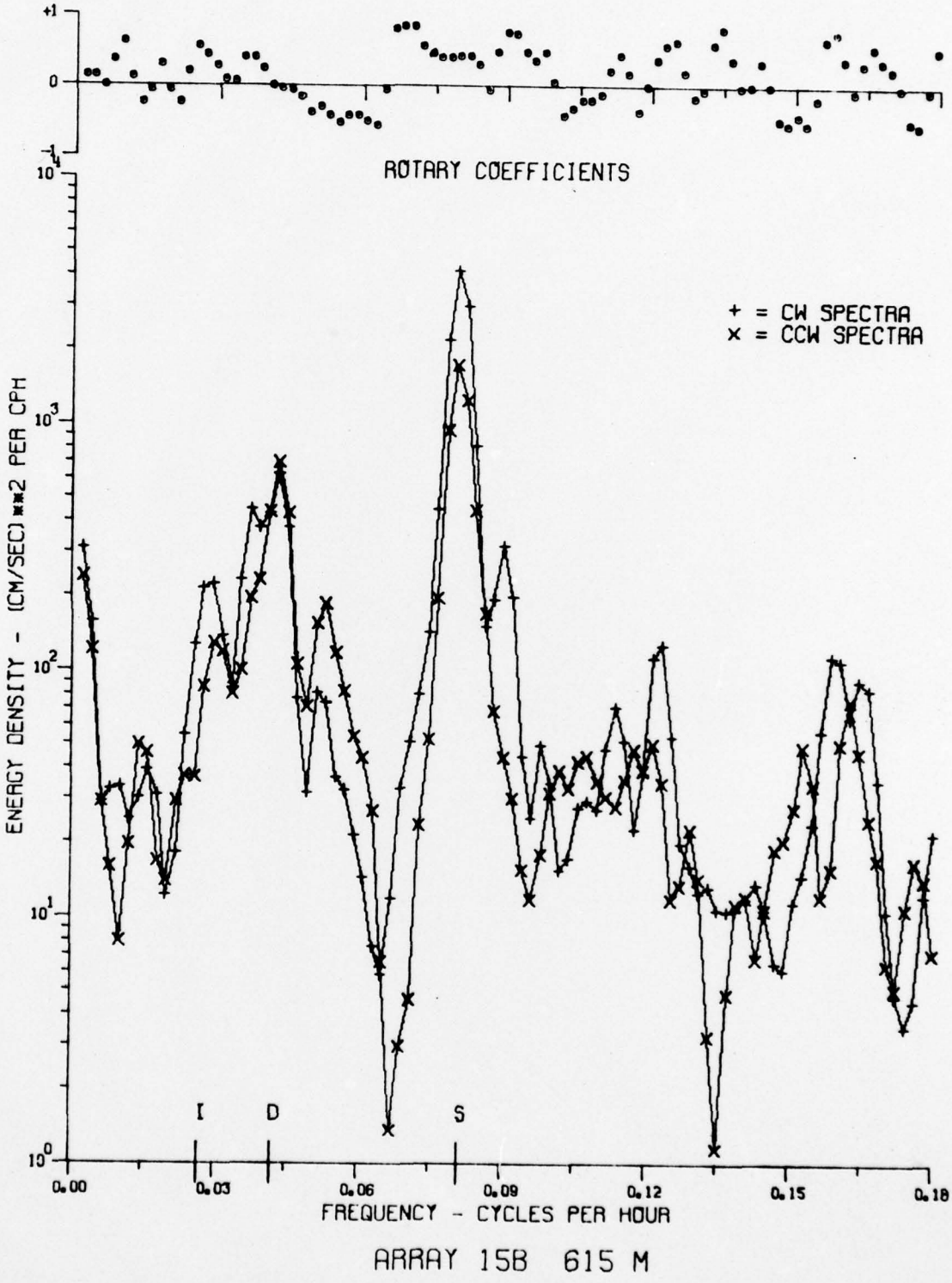
ARRAY 15B 350 M



ARRAY 15B 615 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
× = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 15B 350 M


+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
× = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 15B 615 M

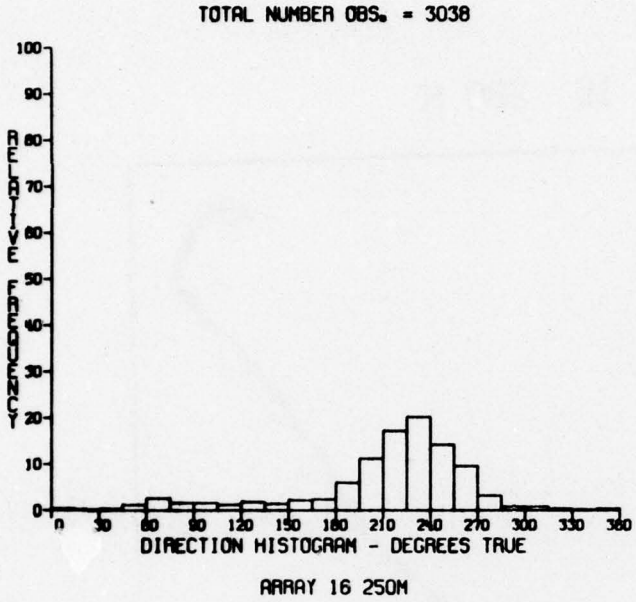
ARRAY 16

CARIB OPS 18 31 48N 64 02 00W FILM 756 START TIME 2200 06/14/72 WATER DEPTH =2
C75M SAMPLE DEPTH= 20CM SAMPLE RATE 10MIN RECORD LENGTH = 514 HOURS

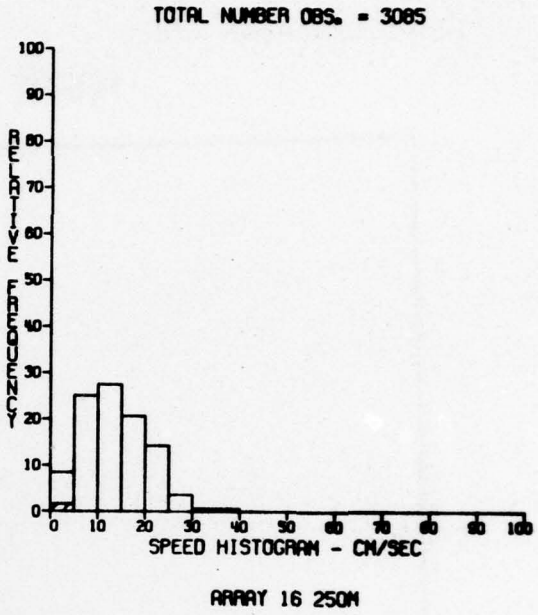
DIRECTION										SUM	PER.CT.
0- 15	2	7								9	0.3
15- 30	3									3	0.1
30- 45	2	5			1					8	0.3
45- 60	6	18	9							33	1.1
60- 75	8	28	38	2						76	2.5
75- 90	10	26	10	3						49	1.6
90-105	12	13	11	13	1					50	1.6
105-120	7	25	5							37	1.2
120-135	9	21	15	7						52	1.7
135-150	9	17	7	7						40	1.3
150-165	15	34	14	2						65	2.1
165-180	14	43	15	1						73	2.4
180-195	8	71	58	32	11					180	5.8
195-210	16	84	136	93	11					340	11.0
210-225	23	120	194	131	50	1				519	16.8
225-240	24	98	153	179	145	15				614	19.9
240-255	14	48	93	104	135	32	4	1		431	14.0
255-270	9	52	52	49	67	40	7	16	1	293	9.5
270-285	8	22	24	10	10	14	6	1		95	3.1
285-300	4	7	9	1	2	2				25	0.8
300-315	5	8	1	1	1	3	2			21	0.7
315-330	2	9	1							12	0.4
330-345		5								5	0.2
345-360	2	6								8	0.3

SPEED	0	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	100	
SUM	212	767	845	635	434	107	19	18	1	0	0	0	0	0	0	0	0	0	0	0	0	3038
PER.CT.	6.9	24.9	27.4	20.6	14.1	3.5	0.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

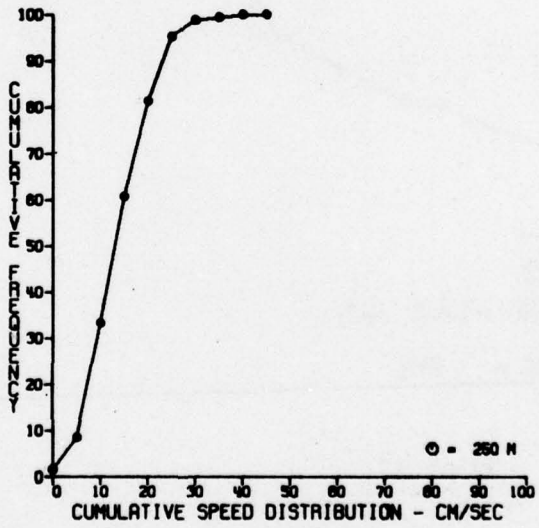
NUMBER OF ZERO SPEED AVERAGES = 47 PERCENTAGE ZERO SPEED AVERAGES = 1.5
TOTAL NUMBER OF OBS. = 3085


TOTAL NUMBER OBS. = 3038
RELATIVE FREQUENCY
DIRECTION HISTOGRAM - DEGREES TRUE
ARRAY 16 250M

(a)

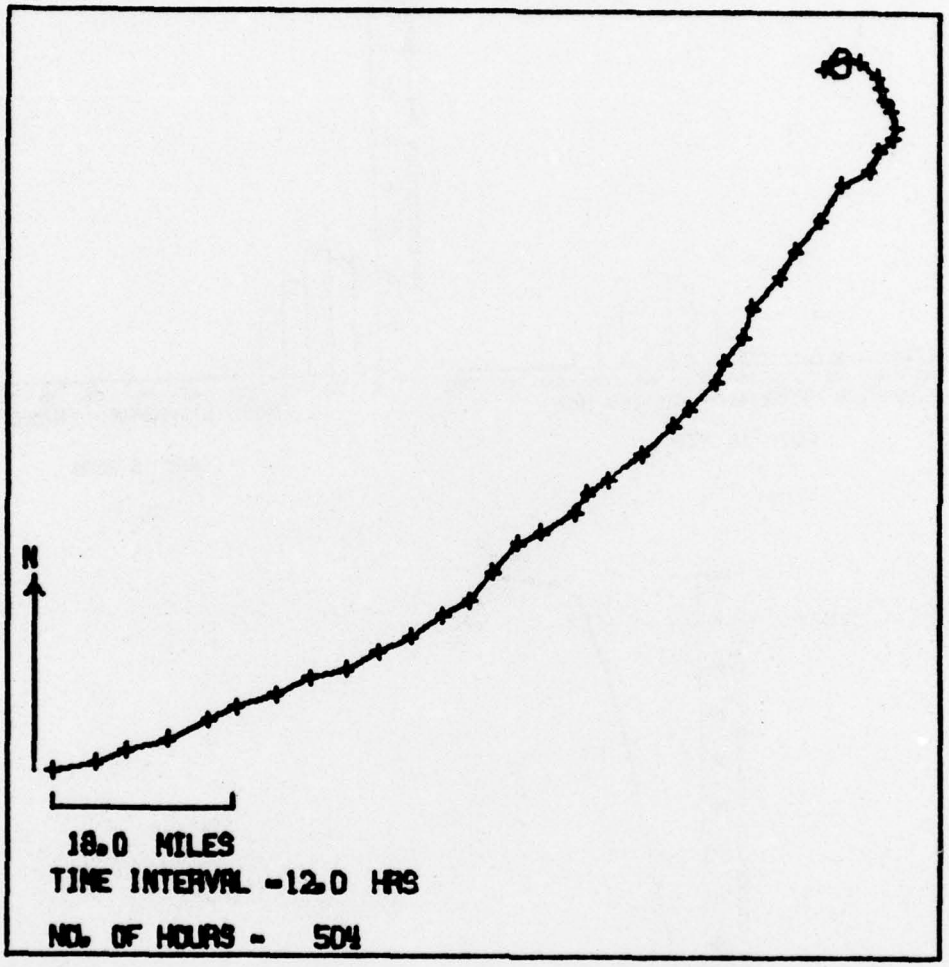

TOTAL NUMBER OBS. = 3085
RELATIVE FREQUENCY
SPEED HISTOGRAM - CM/SEC
ARRAY 16 250M

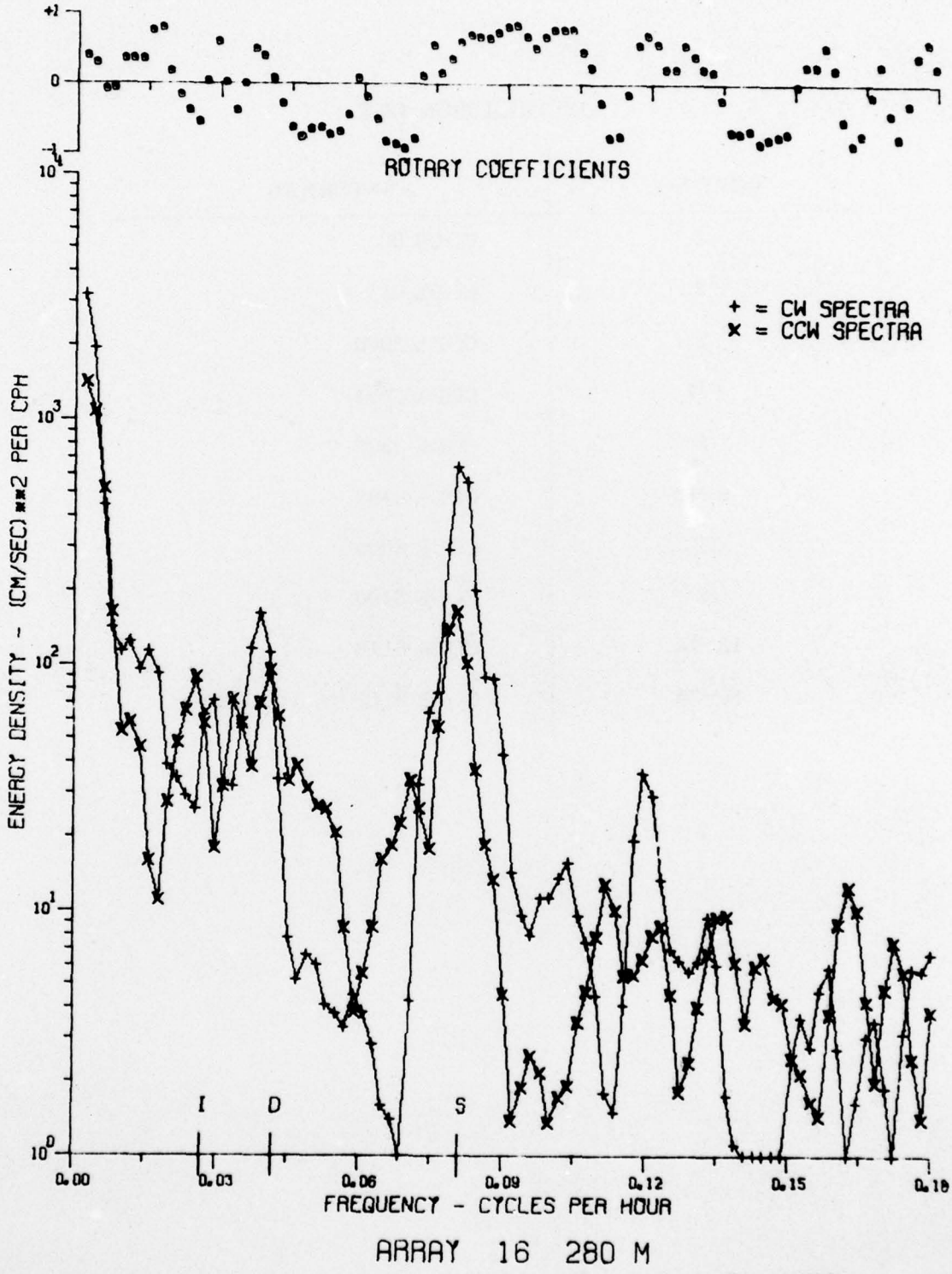
(b)


CUMULATIVE FREQUENCY
⊙ = 250 M
CUMULATIVE SPEED DISTRIBUTION - CM/SEC
ARRAY 16

(c)

ARRAY 16 280 M




+1
0
-1
ROTARY COEFFICIENTS
+ = CW SPECTRA
× = CCW SPECTRA
ENERGY DENSITY - (CM/SEC)**2 PER CPH
10^4
10^3
10^2
10^1
10^0
I
D
S
0.00
0.03
0.06
0.09
0.12
0.15
0.18
FREQUENCY - CYCLES PER HOUR
ARRAY 16 280 M

DISTRIBUTION LIST

COPY NO.	INTERNAL
1	CODE 00
2	CODE 01
3	CODE 3000
4—7	CODE 3004
8	CODE 3330
9—10	CODE 3400
11	CODE 6000
12	CODE 6100
13—14	CODE 6110
15—25	CODE 6110 (D. A. BURNS)